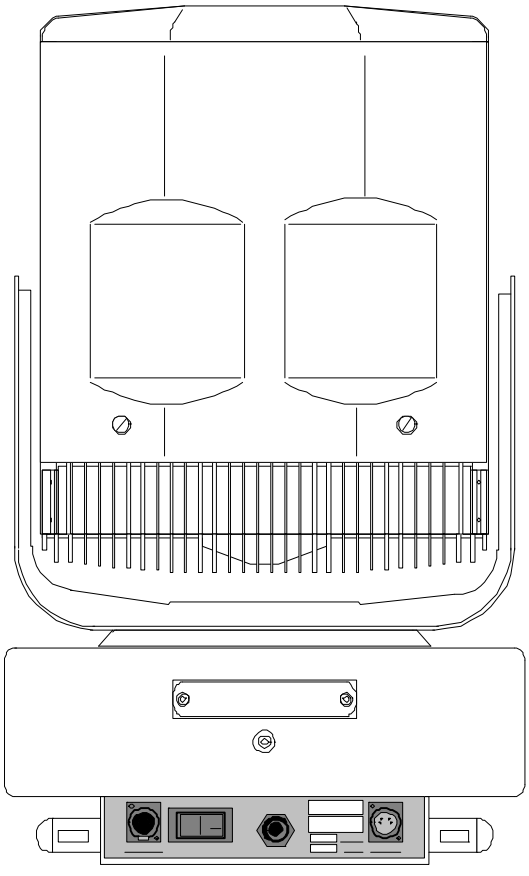
Starlite Mk 5

User/ Service Manual

Version 1.2



Starlite Systems Technology Ltd.

Starlite Systems Technology Ltd.
Calena House
Caxton Street North,
London.
E16 1JL
ENGLAND
Tel. + 44 (0) 171 511 4400
Fax. + 44 (0) 171 476 2922
www.starlite.co.uk

Copyright

©Starlite Systems Technology Limited 1997/98/99. All rights reserved.
Starlite Systems Technology Limited reserve the right to modify Information and Specifications contained within this manual without notice.
Starlite Systems Technology Limited assumes no responsibility for any errors, inaccuracies or omissions that may or may not appear in this manual.
All Stardraw drawings contained in this manual are copyright of Starlite Systems Technology Limited.

Patents

Starlite equipment is protected by U.S., European and other world-wide patents granted or pending.

Trademarks

Starlite Mk5 is a registered trademark of Starlite Systems Technology Limited.
Stardraw and Stardraw Professional are registered trademarks of Starlite Systems Technology Limited.
Starlite is a trade name of Starlite Systems Technology Limited.
Starlite fully acknowledges all other trademarks and trade names mentioned in this manual and disclaim any propriety interest in them or the companies owning them.

Distributor

Lane Lighting Ltd.
Unit 3, Spearmast Industrial Estate,
Lane End Road, Sands,
High Wycombe, Buckinghamshire.
UNITED KINGDOM.
HP12 4JG
Tel. +44 (0) 1494 446000
Fax. +44 (0) 1494 461024
www.starlite.co.uk

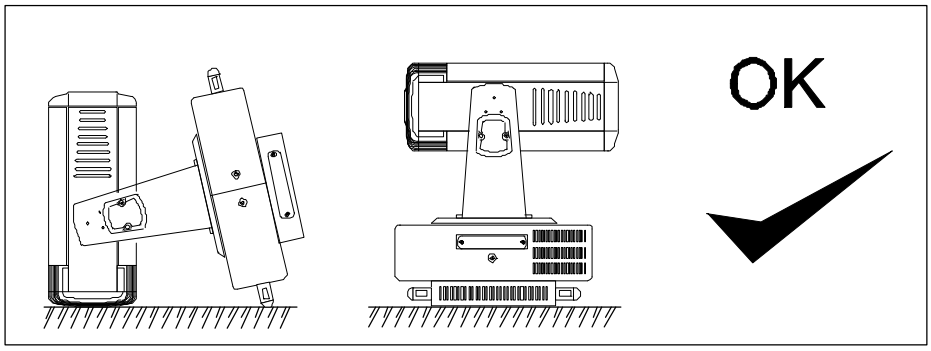
Important Handling Notes

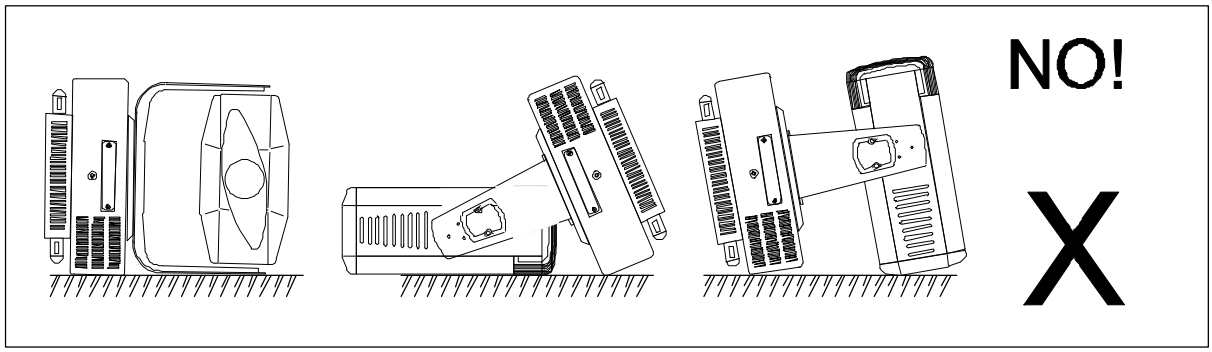
To avoid damaging your Starlite Mk5 unit, please carefully read the following notes on handling the unit before unpacking/using it.

Although the Starlite Mk5 is designed to withstand constant use in all entertainment environments, some care must be taken in the handling of the unit, especially when it is being packed/unpacked and when it is being rigged in its working position.

Please note the following

- **When ever possible, use the handles for carrying the unit around.**
- Make sure you fully appreciate the weight of the unit.
- Use two people to carry the unit when negotiating stairs, moving around a busy working environment or over cables etc.
- **DO NOT** attempt to lift the unit solely by the head, yoke or base.
- **DO NOT** use the front aperture as convenient hand-hold.
- When fitting hanging clamps, place the unit on its side with the base resting on one of the handles and the head resting on the rear casting.
- **DON'T** allow the unit to rest on any of the covers.





Notes

Table of contents

USER/ SERVICE MANUAL 1

Version 1.2 1
Copyright 2
Patents 2
Trademarks 2
Distributor 2
IMPORTANT HANDLING NOTES 3
Notes 4
TABLE OF CONTENTS 5
DECLARATION OF CONFORMITY 8
Standards and Directives 8
Portable Appliance Testing 8
INTRODUCTION 9
Future Developments 9
Customer Feedback 9
Manual Contents/ Unit Modifications 9
Glossary 10
STARLITE MK5 DESCRIPTION AND FEATURES 11
CAUTION AND WARNING SYMBOLS 12
Precautions: 12
Cautions: 13
QUICK REFERENCE GUIDE 14
UNPACKING THE STARLITE 15
Save the shipping materials 15
Flightcase (Roadcase) Design 15
Returning the unit to Starlite 15
ELECTRICAL CONNECTIONS 15
POWER REQUIREMENTS 15
SAFETY INSTRUCTIONS 16
PROGRAMMING/OPERATING HINTS 16
Starting up 16
Programming 16
Shutting Down 16
SPECIFICATIONS (MECHANICAL) 17
Dimensions: 17
Rigging the unit: 18
Safety Wires: 18
Hanging Centres: 18
SPECIFICATIONS (ELECTRICAL) 19
Replacement Lamp Type: 19
Replacement Fuses 19
SPECIFICATIONS (ENVIRONMENTAL CONDITIONS) 20
Working Temperature: 20
Relative humidity: 20
Working environment: 20
Altitude: 20
IP (Ingress Protection) Rating: 20
CONTROL DATA PROTOCOL: 21
Cabling of multiple Units 21
DMX Terminator 21
To Make a DMX Terminator 21

Max. Required DMX Channels: 21
FACTORY SET PERSONALITY 22
DEFAULT CHANNEL CONFIGURATION ("PERSONALITY") 22
UNIT REVIEW 26
Base of the unit 26
Connector Panel 26
Status Indicator Panel 26
SET THE STARLITE MK5 UNIT VOLTAGE 27
DC Supply (Motors & Electronics) Voltage Selection 27
To change the selector switch: 27
Lamp Ballast Voltage/Frequency Selection 28
Magnetic Ballast Version 28
Electronic Ballast Version 28
The Yoke 29
The Head 29
"Fan" Side of the Head (Earlier models) 29
"Fan" Side of the Head (Current models) 30
OPEN VIEW OF THE HEAD (FAN SIDE) 31
"Motherboard" Side of the Head 32
Lamp Housing 33
TO INSTALL OR REPLACE THE LAMP 33
Lamp Installation (cont.) 34
SETTING THE DMX START ADDRESS BCD SWITCHES 35
Self Test Mode 35
SETTING THE DRIVE CARD DIP SWITCHES 36
Drive Card DIP Switches 36
Drive Card Address Information 37
Function Address 37
DMX Address 37
Drive card motherboard positions 38
UNIT REVIEW (CONT.) 39
Front (Indicator) Side of the Base 39
2 Way Switch 39
Status LED's 40
Rear (DC Supply) Side of Base 41
Lamp PSU Side of the Base 41

SERVICING THE STARLITE MK5 42

GENERAL MAINTENANCE AND CLEANING 42
Cleaning the external surfaces 42
REMOVING AND CLEANING THE INTERNAL HEAD COMPONENTS 42
Removing Head Modules 42
Removing the Focus Module 42
Removing the Motherboard 42
Removing the CMY Module 43
Removing the Prism Module 43
Removing the Gobo Module 44
CLEANING HEAD MODULES 45
Cleaning Rotating gobos 45
Cleaning Cross Fade Colours 45
Cleaning the Triplet Lens 45
Cleaning the Prism Module 45
REPLACING PARTS 46
Remove and Install Rotating gobos 46
Remove and replace colour wheel Dichroic Filters 46
Remove and install gobos in the optional Static Wheel. 47
STARLITE MK5 ADJUSTMENTS 48
Adjusting the Decoder card reference voltage. 48

Adjusting the Pan position sensor(Earlier models) 48
To adjust Pan Sensor (cont.) 49
Adjusting the Pan position sensor(Current models) 49
To adjust Pan Sensor (cont.) 50
Adjusting the Pan Gearbox 50
Adjusting the Tilt position sensor 51
Adjusting the Tilt Gearbox 52
Adjusting the Pan/Tilt Drive Card Settings 53
FAULT-FINDING AND REPAIR 54
Introduction 54
Technical Support 54
Fault-Finding (cont.) 55
BASIC TOOLS AND TEST EQUIPMENT REQUIRED 56
SPARES AND OPTIONAL EXTRAS 57
SAMPLE DMX ADDRESSES 58
WARRANTY INFORMATION 59
NOTES, COMMENTS AND PROBLEMS. 60

Declaration of Conformity

Manufacturer's Name: STARLITE SYSTEMS TECHNOLOGY Ltd.
Manufacturer's Address: Calena House
Caxton Street North,
London.
England.
E16 1JL
Great Britain

Declares that, under our sole responsibility, the following product conforms with the protection requirements of Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility

Product Name: STARLITE Mk 5
Product Number: STARLITE Mk 5 / 1200 W
STARLITE Mk 5 / 575 W
Product Options: All

Standards and Directives

EMC Standards and Directives applied to this product.

Generic Standards	Basic Standards	Product Standards
EN 50081-1(1992)	EN 61000-4-2 (Electrostatic Discharge)	EN 55022 (IT Equipment)
EN 50082-1(1992)	EN 61000-4-4 (Fast Transients)	EN 55015 (Electrical Lighting)
	ENV 50140 (Radiated Field)	

Starlite Systems Technology Ltd. London. ENGLAND
4th September 1997

Portable Appliance Testing

In addition to being tested to the above generic International EMC, LVD and Safety Directives/ Standards, **every** Starlite Mk 5 is tested for electrical safety before leaving the factory .
It is highly recommended that you re-apply these tests at intervals, as directed by your local safety authority, to ensure the safety of the Unit(s) and the people and place(s) in which the Unit(s) are being used.
There are normally a minimum of 2 (two) basic tests that should be applied when required, but you should test the equipment fully at regular intervals;

EARTH (GROUND) BONDING TEST: -
Applies a substantial test current, around 25A, down the Earth (Ground) pin of the plug and a probe, which is connected, in turn, to exposed metalwork on the three main sections of the Unit under test. These sections are the head, the yoke and the base. From this the tester determines the resistance of the Earth Bonding, to each section.
For safety, these resistance's should be less than 0.1Ω (Typically 0.05Ω)
Note: When testing, please ensure the Earth probe makes direct contact with metal and **not** the paint covering it.

INSULATION TEST: -
This test applies a voltage of approx. 500 Volts between the live and neutral (bonded together) and the Earth, from which the tester measures the insulation resistance.
For safety, this resistance should be greater than 7 MΩ (Typically 20 MΩ)

Introduction

Thank you for purchasing the Starlite MK5 moving light, manufactured by Starlite Systems Technology Limited. The Starlite MK5 is the most advanced moving yoke instrument that can be purchased in the world today and is ideally suited for theatrical applications, stage, studio, concert touring and night clubs. The unit can be easily configured to different specifications and has been designed for ease of access to individual functions. This makes for simple routine maintenance and cleaning.

Future Developments

Starlite Systems Technology Ltd. has a policy of continually improving design, upgrading manufacturing techniques and researching new feature options for all of its product lines.

Customer Feedback

We welcome all customer feedback, relating to the Starlite Mk 5, as this enables us to improve the product and allows us to design extra features that you would like to see in the unit. Please contact us, or your distributor, with your comments (good or bad!) or suggestions and we will look into them. Our Address, Telephone No's, etc. are on page 2 of this manual.

Manual Contents/ Unit Modifications

As the design and manufacturing methods of the Starlite Mk5 are constantly evolving, this manual (and future versions) will contain full details of all modifications/changes as they become used in manufacture.

Glossary

There are always new abbreviations and acronyms coming into everyday use. So here are most of the ones used in this manual.

AC	Alternating Current. An electric current that constantly reverses its direction. The rate of direction change is the frequency (Hz).	**HT**	High Tension. High voltage. In the Starlite Mk 5 this relates to the connections from the ignitor to the HMI lamp.
AF	Across Faces. Distance between two opposite faces of a spanner (or nut) which is directly related to the thread size. e.g. M5.5 AF spanner fits a nut with 3mm tread.	**ISO**	International Standards Organisation.
BCD	Binary Coded Decimal (switch). A switch that converts a decimal input to a binary output.	**LED**	Light Emitting Diode.
CCW	Counter Clock-Wise. Opposite of Clockwise	**LVD**	Low Voltage Directive. A set of European standards relating to the safety of electrical devices.
CMY	Cyan, Magenta, Yellow. Subtractive colour mixing system used in the Starlite Mk5.	**OD**	Outside Diameter. The outside diameter of a circular object (as opposed to the inner diameter (ID)). e.g. a washer.
CTC	Colour Temperature Correction. The use of colour filters to correct (or change) the colour temperature of a light source.	**PFC**	Power Factor Correction. The use of capacitors (or inductors) for phase shifting in electronic circuits so that the actual power equals (or is close to) the apparent power.
CW	Clock-Wise. Mimicking the movement of the hands on a clock-face.	**PTFE**	Poly-Tetra-FluoroEthelyne. A synthetic lubricant. Trademark “Teflon”
DC	Direct Current. An electric current which flows only in one direction.	**SMPSU**	Switch-Mode-Power-Supply-Unit. A totally electronic type of PSU (Power Supply Unit)
DIL	Dual In Line. See DIP	**(T)**	Time-delay or Time-lag (fuse types). A type of fuse which allows for the electrical surge of a circuit energising without rupturing.
DIP	Dual Inline Package. A small electronic package with two parallel rows of connections.	**UNC**	Unified National, Coarse. A system of machine threads using the imperial measurement system.
DMX	Digital multiplex. **Also DMX512 (1990)** The data transmission protocol used by the Starlite Mk 5 (and most other manufacturers)	**USITT**	United States Institute of Theater Technology.
EMC	Electro-Magnetic Conformity. A set of European standards relating to the electronic emissions and immunity of electrical devices.	**UV**	Ultra Violet. Invisible radiation from the blue end of the spectrum.
fps	flashes per second. Frequency of a strobing light.	**WWW**	World Wide Web. The Internet.
HMI	Halogen Metal Iodide. A type of mixture (of rare earths and gases) used in the envelope of the arc lamp.	**XLR**	Generic term used to describe a range of audio/data connectors. A trademark of ITT Cannon.

Starlite MK5 Description and features

Movement
360º Pan / 270º Tilt, DC Drive Motors for Ultra-smooth movement
Pan / Tilt Feedback Sensors for accurate positioning and position repeatability
Gobos
2 x 6 position rotating gobo wheels with vari-speed rotation (both directions) and indexing
Suitable for interchangeable Glass, Metal or Dichroic Colour gobos
Takes T size gobos (46.5mm OD, 38mm Dia. image size) or,
44mm OD (with adapter ring, Part No. 0385)
Using both gobo wheels and the remote focus facility it is possible to "Morph" between gobos
Colour
Cyan, Magenta, Yellow Subtractive Colour mixing system allowing infinite colour selection with smooth x-fades or "snap" colour changes
6 position Colour wheel with interchangeable Dichroic filters (46.5mm OD)
2 Colour Temperature Correction, Red, Green and Blue Filters already installed.
Vari-speed wheel allowing scrolling, continuous scrolling or "bump" colour changes
Beam Effects
Multi-beam rotating 5 Facet Prism with vari-speed rotation (both directions)
(Additional effects available)
Shutter
Fast, silent Shutter with variable speed (1 fps -7 fps) Strobing facility
Dimmer
Separate full range (0-100%) Dimmer allowing fast/slow smooth dimming
Focus
Remote Motorised Focus adjustment using high optical quality triplet lens
Triplet Lens is interchangeable to allow different beam angles
(In development)
Diffusion
Sharp-edged beam to Wash beam variable Frost mechanism
Iris
Pin-spot to Full-beam smooth running motorised Iris for varying beam angles
Light Source
575 or 1200 W/GS HMI Lamp wattage options, Daylight (6000ºK) Colour Temperature
750 hrs rated lamp life
Lamp Power Supply
Magnetic ballast or Electronic ballast options (Power factor corrected) for both lamp options.
Optical Output
Custom designed optical path, utilising coated optics, cold-mirrored reflector and Triplet projection lens.
Lamp Cooling
Finned lamp housing is custom designed to minimise the amount of forced air-cooling required thereby reducing the associated fan noise.
Control Protocol
DMX512 (USITT 1990) with a user definable channel configuration.
Default factory set channel configuration uses a maximum of 19 channels.
Mechanical Construction
Modular design allows for module swapping, upgrading, easy servicing and cleaning.
Easy internal access and fast Lamp change (thru safety interlocked door)
Four carrying handles and multiple hanging points
Rugged construction and durable exterior epoxy paint finish

Caution and Warning Symbols

The following International symbols are used throughout this manual to identify warning and caution messages.

Caution: **This symbol appears adjacent to Caution messages. Failure to heed these messages could result in minor injury and damage to equipment.**

Warning: This symbol appears adjacent to High Voltage Warning messages. Failure to heed these messages could result in serious personal injury.

High Temperature: This symbol appears adjacent to High Temperature Warning messages. Failure to heed these messages could result in personal injury.

Explosion: This symbol appears adjacent to Explosion Warning messages. Failure to heed these messages could result in personal injury. These messages warn of possible high pressure lamp explosions. Always wear eye protection and clothing as per lamp manufactures guidelines.

Precautions:

- The STARLITE Mk5 is **NOT** intended for domestic or outdoor use.
- Check the unit is set correctly for the local electricity supply.
- The unit must be protected by a fuse/breaker, of the correct type and rating
- For safety reasons and correct operation, the unit(s) must be earthed!
- The Starlite Mk5 lamp will produce ultraviolet radiation in use. Exposure to unshielded lamp will result in skin and eye burns. The unit is fitted with an interlock system, which will extinguish the lamp if the lamp-housing door is opened. This interlock is fitted for your protection and should not be tampered with.
  Do not attempt to open the lamp housing whilst the lamp is in operation!
- Allow the unit to cool sufficiently before changing the lamp. (typically 20 mins)
- Disconnect the power cord before :
  - changing the lamp
  - altering unit voltage
  - fault finding/maintenance
- To avoid the risk of electric shock or fire, do not operate the unit in close proximity to liquids or moisture of any kind.
- Fuses should only be replaced with the specified type, voltage and current ratings.
- Rig the unit with care and **ALWAYS** use a safety wire.
- When rigging the unit, allow enough space for the movement of the head and ensure the unit, and its output beam, are a safe distance away from flammable materials.
- Make sure all cables (and other objects) clear of the area used for head movement.
- Ensure the unit has cooled completely before packing it away (allow 25 mins).
- Use the handles for carrying the unit.

Cautions:

- READ THE USER MANUAL BEFORE USING THIS UNIT.
- Please make note and heed the warning labels located on the rear side panel of the unit head and the base power panel.
- Ensure that all latches and covers are securely fastened before attempting to operate the unit.
- The outside of the unit (especially the lamp housing) gets very hot during use. Allow sufficient time for cooling before working on the unit.
- Only transport the unit in its original packaging or a properly constructed flightcase.
- The Starlite Mk5 contains no user serviceable parts other than consumable part replacement and normal preventative maintenance. Servicing must be carried out by authorised and suitably trained or instructed personnel.

Quick Reference Guide

This Quick Reference Guide is intended only as a reminder of the main elements concerning the use of a Starlite Mk5. It is not intended as a substitute for reading the whole, or parts of, the manual.

Please ensure that you have read and completely understood the manual <u>before</u> attempting to operate the unit.

Safety

Please check, or reacquaint yourself with, the safety instructions contained in this manual.

Power Connections

Ensure you know what type of unit, i.e. lamp wattage and PSU type, that you are using and that the unit is set to match the local electrical supply **BEFORE CONNECTING, AND SWITCHING ON, THE UNIT(S).**

1. For all models, please check the voltage selector switch is correctly set before attempting to switch on the unit(s)
2. For magnetic ballast models, please check the frequency of the local supply and the frequency tap of the unit before attempting to switch on the unit(s)

<u>Please ensure all units are Earthed (Grounded).</u>

Data Connections

Check that you have set the correct start address for each unit and that you do not run out of DMX channels (on each DMX string)

Please make sure that the unit is supplied with a proper DMX512 (USITT) data signal.
Most problems with DMX controlled equipment are due to bad data signal connections caused by using the wrong type of cable/connectors and earthing (grounding) techniques.
Do not use microphone or other audio cable for DMX connections!

The Starlite Mk 5 uses a maximum of 19 DMX channels per unit (dependant on specification), which equates to a minimum of 26 units per 512 channel DMX string.

Default (factory set) "Personality"

Channel Number	Function	Channel Number	Function
1	Pan (High Byte)	**11**	Gobo Rotate Wheel No.2
2	Pan (Low Byte)	**12**	Gobo Select Wheel No.2
3	Tilt (High Byte)	**13**	Focus
4	Tilt (Low Byte)	**14**	Iris
5	Colour Wheel	**15**	Prism
6	Cyan Colour Fade	**16**	Frost
7	Magenta Colour Fade	**17**	Shutter
8	Yellow Colour Fade	**18**	Dimmer
9	Gobo Rotate Wheel No.1	**19**	Speed
10	Gobo Select Wheel No.1		

<u>If you have any doubts about using/operating the Starlite Mk 5, please refer to the appropriate section in this manual before switching on the unit !</u>

User Manual

Unpacking the Starlite

Save the shipping materials

The shipping carton has been designed to protect the unit during transportation. If you ever need to return the unit for repair or service, please ensure that the original cartons are used. Units returned in inadequate packaging may void the warranty.

Flightcase (Roadcase) Design

Any case used for transporting the Starlite Mk 5 must be carefully designed. It must contain strong, semi-rigid supports for the different sections of the unit, enclosed in a rigid outer casing. Ready made flight cases can be obtained through your distributor. Starlite Systems Technology Ltd. (or its distributors) will not be liable for any damage caused to a unit which is returned, to us, in a non-approved flightcase.

Returning the unit to Starlite

All goods returned to the factory must be allocated a Return Number prior to shipping. This should be obtained from your local distributor. The factory may not accept goods returned without a valid Returns Number.

Electrical Connections

The Starlite Mk 5 is despatched without a plug fitted, allowing the user to choose the correct connector for their particular circumstances.
Please observe the following colour code when fitting a plug to your unit.

- Green and Yellow Wire--- Earth (Ground)
- Blue---Neutral (Cold, Return)
- Brown---Live (Hot, Phase)

It is the sole responsibility of the owner / user to correctly fit the proper plug in accordance with local regulations.
WARNING: CLASS 1 EQUIPMENT. THIS EQUIPMENT MUST BE EARTHED.

Power Requirements

Each Starlite Mk 5 should be powered from its own separately protected supply.
The cabling and circuit protection on these spurs must be of suitable rating for the units connected to them. ***See*** **the ratings label on the connector panel situated on the base of the unit for details.**
Please also note the following points:

- Once the lamp has come up to temperature, the Starlite Mk 5 draws a constant current. Therefore please allow for this when cabling up the unit(s).
  (***See*** Specifications (Electrical))
- DO NOT connect the Starlite Mk 5 to any type of dimmer circuit.
- On powering up, the lamp and its power supply draw a peak (surge) current that is several times more than its normal operating current. For this reason, please ensure that circuit protection is of the high-surge type. i.e. high-surge thermal breakers
- Because of the initial high-surge current, it is recommended that multiple units are switched one at a time and allowed to come up to temperature.
- Magnetic circuit breakers are not recommended for Starlite Mk 5 circuit protection due to the various different types and their different tripping characteristics.

Safety Instructions

Please make sure that you read and understand the sections relating to safety contained in this manual.

Programming/Operating Hints

These are a few hints for programmers/operators who have not used this make or type of unit before. (i.e. a “moving head” unit against a “moving mirror” unit)

Starting up

It’s preferable to have a pre-programmed a home cue in your control desk before applying the DMX signal to the unit(s). This cue should contain the following elements;

- Pan, Tilt, CMY, focus, iris, frost and dimmer @ 50%
- Shutter @ 100%
- All other Channels @ 0 %

This will let the lamp strike with the unit pointing straight down(assuming the unit is hanging from a truss) enabling the operator to see the beam and check all the functions.

Programming

Remember to allow the lamp to come up to temperature (5-10 mins) before creating any colour (CMY) mixes.

If you are used to programming “moving mirror” units, please note the following differences,

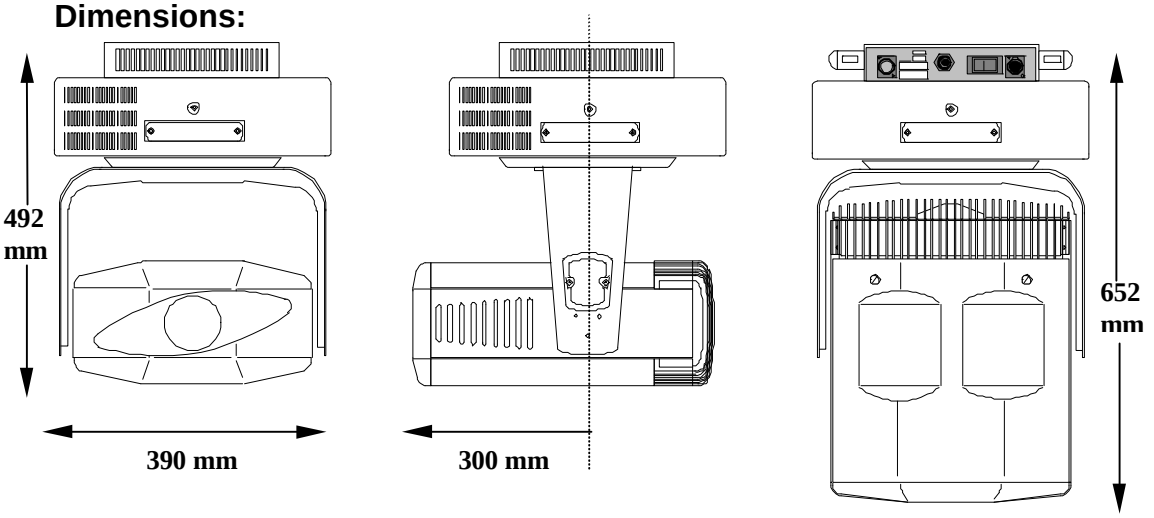
- Almost all of the unit functions are contained in the head. Although this gives far more functional pan and tilt movement, it obviously makes the head much heavier than a small, moving mirror. Therefore, to reduce unnecessary wear on the pan/tilt drive units, please don’t let the head move around(especially at speed) when not required .i.e. when shuttered/dimmed out.
- The image of a gobo comes out the “right way round”, because there is no mirror to reverse it.
- Because of the greater range of the pan and tilt functions, careful fore-thought is required in programming to stop the unit panning to a position “the long way round.” i.e. panning 270º when only 90º is required.
- Please be careful when panning/tilting the head at speed. The head has a lot of momentum when moving, so make sure people/property are clear of it.(For safety, slipping clutches are fitted, but don’t try them out on a colleague!)

Shutting Down

When shutting down a system, place the units in the home cue (***See*** above) and then disconnect the DMX signal (the green LED will start flashing). After two minutes the lamps will extinguish, leaving the cooling fans running (and two of the red LED’s will start flashing) . Then after a further three minutes, the red LED’s will stop flashing, indicating it is safe to switch off the units and disconnect from the power source.
(***See*** Status Indicator Panel)

Specifications (Mechanical)

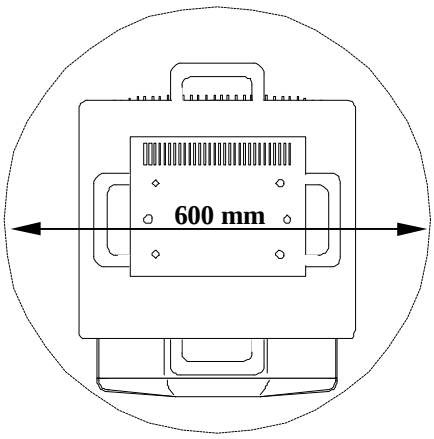
Dimensions:

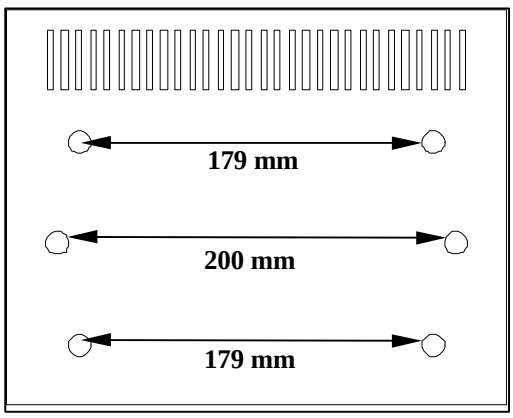


Unit Weight:

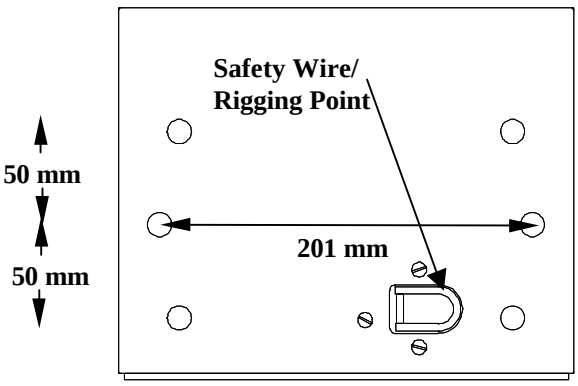
(Excludes fixings)

- 1200 W (Magnetic Ballast) 35 Kgs (77.0 lbs.) Approx.
- 575 W (Magnetic Ballast) 32 Kgs (70.4 lbs.) Approx.
- 575 W (Electronic Ballast) 27 Kgs (59.4 lbs.) Approx.
- 1200 W (Electronic Ballast) T.B.A





Detail of base fixing points (M10 threaded)
EARLIER MODELS



Detail of base fixing points (M10 threaded)
CURRENT MODELS

Rigging the unit:

The base of the lamp has six threaded inserts (for ISO M10 bolts) for fixing hanging clamps, of which, a minimum of two must be used for bolting on the hanging clamps.(***See*** diagram)

These bolts must not protrude more than 30mm into the base of the unit.

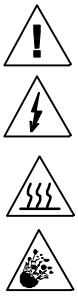
It is recommended "wrap-over" (half couplers or Cheeseborough) type clamps are used. These are available in pairs, from STARLITE, complete with fixing bolts. Part No.0370/2

An optional base plate, with additional ¼ turn "Camloc" fixing points, is also available, from STARLITE Part No. 0340/C.

Safety Wires:

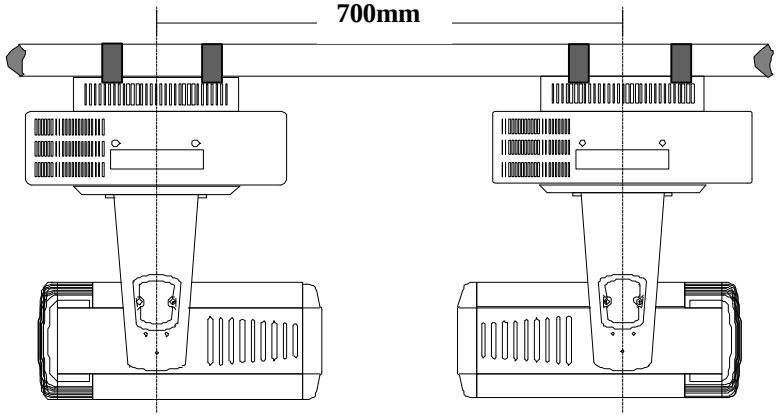
On the latest models, a flip up safety point has been provided, on the base plate, to assist with the use of safety wires and as a roping/lifting point when rigging.

PLEASE NOTE: The positioning, fixing and safety bonding of the unit is the sole responsibility of the owner/user. Please make sure the unit is properly secured and has a safety wire in compliance with local safety regulations.



Hanging Centres:

Please ensure that there is 700 mm (27.5 ins) between the centres of the units to allow for unrestricted movement of head and 750mm (29.5 ins) away from any combustible materials (curtains, plastics, etc.)



Specifications (Electrical)

Unit Type	Voltage Range	Frequency Range	Current Consumption (@ 230 V/50 Hz)	Power Consumption (@ 230 V/50 Hz)
575 W Magnetic Ballast	**200-250 V**	**50 / 60**	**3.2 A**	**0.75 kW**
575 W Electronic Ballast	**95-130 / 200-250**	**47 - 65**	**4.4 A**	**1.0 kW**
1200 W Magnetic Ballast	**200-250 V**	**50 / 60**	**7.2 A**	**1.7 kW**
1200 W Electronic Ballast	**95-130 / 200-250**	**47 - 65**	**6.7 A**	**1.5 kW**

Replacement Lamp Type:

575 W models 575 W/GS HMI Lamp, Osram ™ (or equivalent)

1200 W models 1200 W/GS HMI Lamp, **“** **“**

Please Note: Certain types of HMI Lamps will not work with the different ballast/ignitor combinations available in this unit, due to the manufacturer’s varying gas/rare earth mixtures. Please consult your distributor/Starlite for advice.

Replacement Fuses

FUNCTION	FUSE RATING	FUSE SIZE
Fans, +5 volts	2 Amp (T) 250 V	20mm or 32mm (1¼”)
volt select switch	3.15 Amp (T) 250 V	20mm
pan/tilt motors	2.5 Amp (T) 250 V	20mm or 32mm (1¼”)
24 V stepper drive	6.3 Amp (T) 250 V	20mm or 32mm (1¼”)
12 V stepper drive	10 Amp (T) 250 V	20mm or 32mm (1¼”)

PLEASE NOTE: Replacement fuses must be of the “T” type (i.e. time delay/slow blow) and of the correct voltage/current rating.
Replacement fuses are available from your distributor/Starlite.

Specifications (Environmental Conditions)

Working Temperature:

Maximum	40º C (104º F)
Minimum	5º C (41º F)

Relative humidity:

Maximum	80% (up to 31º C) 40% (at 40º C)

Working environment:

Working area	Indoor use only

Altitude:

Maximum	2000 M (6500 ft)

IP (Ingress Protection) Rating:

IP20

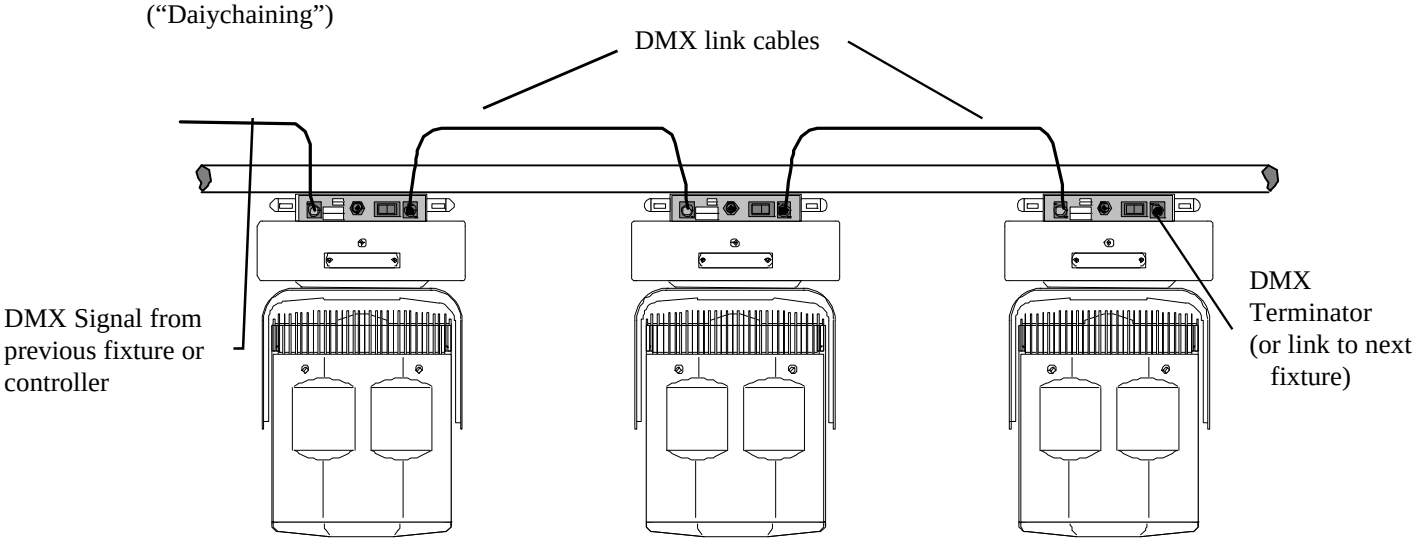
Control Data Protocol:

The STARLITE Mk 5 has been designed to be controlled by the USITT DMX512 (1990) data transmission protocol. The input / through-outputs are wired to 5-way XLR type connectors, as specified in the above protocol. Please ensure that you use the correct connectors and cable when connecting your system together to alleviate data transmission problems.

5-Pin XLR Connections **Pin 1= Cable Screen**
Pin 2= -ve Data
Pin 3= +ve Data
Pin 4= Reserved for future developments
Pin 5= Reserved for future developments

Cabling of multiple Units

The DMX data protocol, which uses serial data transmission, allows multiple units to be controlled using only one data cable to the first unit and then linking all subsequent units in a chain. ("Daiychaining")



DMX Terminator

The DMX data stream needs to be terminated. This is to stop signal reflections and interference by other Electro-magnetic signals, both of which would corrupt the legitimate data signal.
Please remember to use a line terminator in the last (DMX controlled) unit of the DMX chain.

To Make a DMX Terminator

A DMX Terminator can easily be made by connecting a 120 Ω, 1/4 Watt Resistor between pins 2 and 3 inside a male 5-pin XLR connector.

Max. Required DMX Channels:

A maximum of 19 DMX Channels are required for a STARLITE Mk5.(The No**.** of channels is dependent on units configuration) Therefore a maximum of 26 STARLITE Mk 5's may be controlled from one (DMX) Control Desk output string.
Please remember to use a line terminator in the last (DMX controlled) unit of the DMX chain.

Factory Set Personality

The Starlite Mk 5 is despatched with the default personality set (as described below) but this can be altered to any other personality, if the user wishes. This feature is extremely useful when the Starlite Mk 5 is being used along with, or takes the place of, other makes of moving lights. The Starlites can be configured to the personality required, there by reducing programming time.
(***See***: Setting the Personality and Address DIP Switches)

Default Channel Configuration ("Personality")

DMX CHANNEL NO.	UNIT FUNCTION	DMX VALUE	CHANNEL VALUE (1-100%)	SPEED CHANNEL ENABLED (CH. 19)	NOTES
1	**Pan (Hi-Byte)**	0-255	**0-100%**		**Normally combined in the control desk.**
2	**Pan (Low-Byte)**	0-255	**0-100%**		
3	**Tilt (Hi-Byte)**	0-255	**0-100%**		**Normally combined in the control desk.**
4	**Pan (Low-Byte)**	0-255	**0-100%**		
5	**Colour Wheel**				
	Open White	0	**0%**		
	Bump to Colour 1 (Blue 107)	8	**3%**		
	Bump to Colour 2 (Green 206)	16	**6%**		
	Bump to Colour 3 (Red 301)	24	**9%**		
	Bump to Colour 4 (Orange CTC)	32	**13%**		
	Bump to Colour 5 (Blue CTC)	40	**16%**		
	Open White	64	**25%**	Yes	
	Scroll to Colour 1 (Blue 107)	72	**28%**	Yes	
	Scroll to Colour 2 (Green 206)	80	**31%**	Yes	
	Scroll to Colour 3 (Red 301)	88	**34%**	Yes	
	Scroll to Colour 4 (Orange CTC)	96	**38%**	Yes	
	Scroll to Colour 5 (Blue CTC)	104	**41%**	Yes	
	Continuous Colour Scroll (Slow)	128	**50%**		
	" " "				
	" " "				
	" " "				
	Continuous Colour Scroll (Fast)	255	**100%**		
6	**Cyan**				
	Open	0	**0%**		
	Cyan				
	Closed (Full Cyan Colour)	255	**100%**		
7	**Magenta**				
	Open	0	**0%**		
	Magenta				
	Closed(Full Magenta Colour)	255	**100%**		
8	**Yellow**				
	Open	0	**0%**		
	Yellow				
	Closed(Full Yellow Colour)	255	**100%**		

DMX CHANNEL NO.	UNIT FUNCTION	DMX VALUE	CHANNEL VALUE (1-100%)	SPEED CHANNEL ENABLED (CH. 19)	NOTES
9	**Gobo Rotate Wheel 1**				
	Stop	0	**0%**		
	Rotate (Fast) CW	4	**1.5%**		When Channel 10, Gobo Select (1), is between the values of 0 - 127 (DMX) 0 - 49.5% (Channel)
	" CW				
	Rotate (Slow) CW	120	**47%**		
	Stop	127	**49.5%**		
	Rotate (Slow) CCW	134	**52.5%**		
	" CCW				
	Rotate(Fast) CCW	255	**100%**		
	Registration 0°	0	**0%**		When Channel 10, Gobo Select (1), is between the values of 128-255 (DMX) 50-100% (Channel)
	"				
	"				
	"				
	Registration 360°	255	**100%**		
10	**Gobo Select Wheel 1**				
	Open White	0	**0%**		
	Bump Change Gobo "Rotation" 1	8	**3%**		
	Bump Change Gobo "Rotation" 2	16	**6%**		
	Bump Change Gobo "Rotation" 3	24	**9%**		
	Bump Change Gobo "Rotation" 4	32	**13%**		
	Bump Change Gobo "Rotation" 5	40	**16%**		
	Open White	64	**25%**	Yes	
	Scroll Change Gobo "Rotation" 1	72	**28%**	Yes	
	Scroll Change Gobo "Rotation" 2	80	**31%**	Yes	
	Scroll Change Gobo "Rotation" 3	88	**34%**	Yes	
	Scroll Change Gobo "Rotation" 4	96	**38%**	Yes	
	Scroll Change Gobo "Rotation" 5	104	**41%**	Yes	
	Open White	128	**50%**		
	Bump Change Gobo "Indexing" 1	136	**53%**		
	Bump Change Gobo "Indexing" 2	144	**56%**		
	Bump Change Gobo "Indexing" 3	152	**59%**		
	Bump Change Gobo "Indexing" 4	160	**63%**		
	Bump Change Gobo "Indexing" 5	168	**66%**		
	Open White	192	**75%**	Yes	
	Scroll Change Gobo "Indexing" 1	200	**78%**	Yes	
	Scroll Change Gobo "Indexing" 2	208	**81%**	Yes	
	Scroll Change Gobo "Indexing" 3	216	**84%**	Yes	
	Scroll Change Gobo "Indexing" 4	224	**88%**	Yes	
	Scroll Change Gobo "Indexing" 5	232	**91%**	Yes	

DMX CHANNEL NO.	UNIT FUNCTION	DMX VALUE	CHANNEL VALUE (1-100%)	SPEED CHANNEL ENABLED (CH. 19)	NOTES
11	**Gobo Rotate Wheel 2**				
	Stop	**0**	**0%**		When Channel 12, Gobo Select (2), is between the values of 0 - 127 (DMX) 0 - 49.5% (Channel)
	Rotate (Fast) CW	**4**	**1.5%**		
	" CW				
	Rotate (Slow) CW	**120**	**47%**		
	Stop	**127**	**49.5%**		
	Rotate (Slow) CCW	**134**	**52.5%**		
	" CCW				
	Rotate(Fast) CCW	**255**	**100%**		
	Registration 0°	**0**	**0%**		When Channel 12, Gobo Select (2), is between the values of 128-255 (DMX) 50-100% (Channel)
	"				
	"				
	"				
	Registration 360°	**255**	**100%**		
12	**Gobo Select Wheel 2**				
	Open White	**0**			
	Bump Change Gobo "Rotation" 1	**8**			
	Bump Change Gobo "Rotation" 2	**16**			
	Bump Change Gobo "Rotation" 3	**24**			
	Bump Change Gobo "Rotation" 4	**32**			
	Bump Change Gobo "Rotation" 5	**40**			
	Open White	**64**		Yes	
	Scroll Change Gobo "Rotation" 1	**72**		Yes	
	Scroll Change Gobo "Rotation" 2	**80**		Yes	
	Scroll Change Gobo "Rotation" 3	**88**		Yes	
	Scroll Change Gobo "Rotation" 4	**96**		Yes	
	Scroll Change Gobo "Rotation" 5	**104**		Yes	
	Open White	**128**			
	Bump Change Gobo "Indexing" 1	**136**			
	Bump Change Gobo "Indexing" 2	**144**			
	Bump Change Gobo "Indexing" 3	**152**			
	Bump Change Gobo "Indexing" 4	**160**			
	Bump Change Gobo "Indexing" 5	**168**			
	Open White	**192**		Yes	
	Scroll Change Gobo "Indexing" 1	**200**		Yes	
	Scroll Change Gobo "Indexing" 2	**208**		Yes	
	Scroll Change Gobo "Indexing " 3	**216**		Yes	
	Scroll Change Gobo "Indexing " 4	**224**		Yes	
	Scroll Change Gobo "Indexing " 5	**232**		Yes	

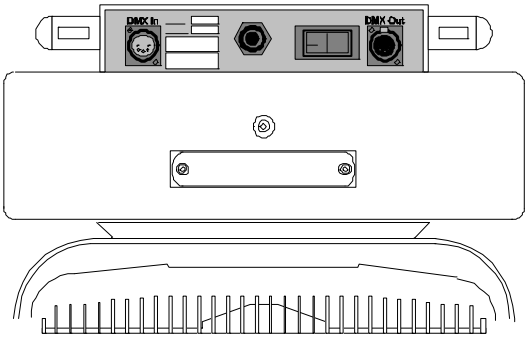
DMX CHANNEL NO.	UNIT FUNCTION	DMX VALUE	CHANNEL VALUE (1-100%)	SPEED CHANNEL ENABLED (CH. 19)	NOTES
13	**Focus**				
	Near	**0**	**0%**	Yes	
	Far	**255**	**100%**	Yes	
14	**Iris**				
	Closed (Small)	**0**	**0%**	Yes	
	Open(Large)	**255**	**100%**	Yes	
15	**Prism**				
	Open(No Prism in)	**0**	**0%**		
	Rotate Fast CW	**40**	**16%**		
	Rotate Slow CW	**120**	**47%**		
	Stop	**127**	**49.5%**		
	Rotate Slow CCW	**134**	**52.5%**		
	Rotate Fast CCW	**225**	**88%**		
16	**Frost**				
	Open(Hard Edged)	**0**	**0%**		
	Closed(Diffused)	**255**	**100%**		
17	***Shutter**				
	Closed	**0**	**0%**		
	Strobing Slow	**15**	**6%**		
	Strobing fast	**247**	**97%**		
	Open	**248**	**97.5%**		
18	**Dimmer**				
	Closed	**0**	**0%**		
	*(Shutter Blades Close)	**2**	**0.75%**		
	Open	**255**	**100%**		
19	**Timing**(Speed)				
	Min	**0**	**0%**	N/A	
	Max	**255**	**100%**		

Unit review

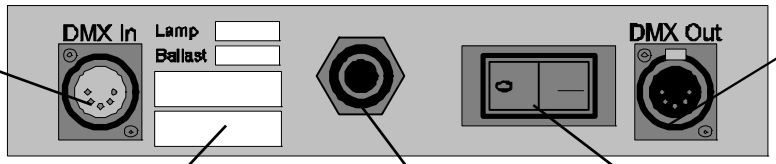
Base of the unit

The base contains the power supply for the lamp, logic and drive functions, power and data connectors and status indicators.

Connector Panel



The connector panel is located in the base of the unit and contains the power-input cable, data connectors and the circuit breaker/power switch.



5-Way chassis male XLR connector for DMX input

5-Way chassis female XLR connector for DMX thro' output

Specification Label

Power cable

Power switch

Status Indicator Panel

On the front base cover there is a panel with five LED's recessed behind it. These LED's indicate various unit conditions. There are 4 red LED's marked 1 to 4 and 1 green. The green LED signifies the DMX Data Status. The green LED should remain lit when there is no DMX signal present. When a valid DMX signal is applied, the green LED will extinguish. Status LED's 1 to 4 show the lamp, interlock and switch states and should not be lit after the lamp has struck or during normal use.
For more information, please refer to section "2 way Switch"

Set the Starlite MK5 Unit Voltage

The method of setting the unit voltage varies depending on which type of lamp ballast is fitted to the unit.
Please refer to the specification label on the base of the unit to determine what type of lamp ballast is in the unit.

In an "electronic ballast" model only the DC supply voltage may need to be altered because the Switch-mode lamp supply is auto-switching and is not frequency dependant.

Electronic ballast models are operable in the following Voltage/Frequency ranges;
95-130 Volts and 200-250 Volts AC at 47-65 Hz

In an "magnetic ballast" model, both the DC supply voltage **and** the magnetic ballast frequency may need to be altered.

Magnetic ballast models are operable in the following Voltage/Frequency range;
200-250 Volts and 50 or 60 Hz

DC Supply (Motors & Electronics) Voltage Selection

The unit "DC supply" voltage selection can be set by adjusting the voltage select switch located in the base of the unit. Access to this switch requires the removal of the base covers and therefore care should be taken to avoid the possibility of electric shock.

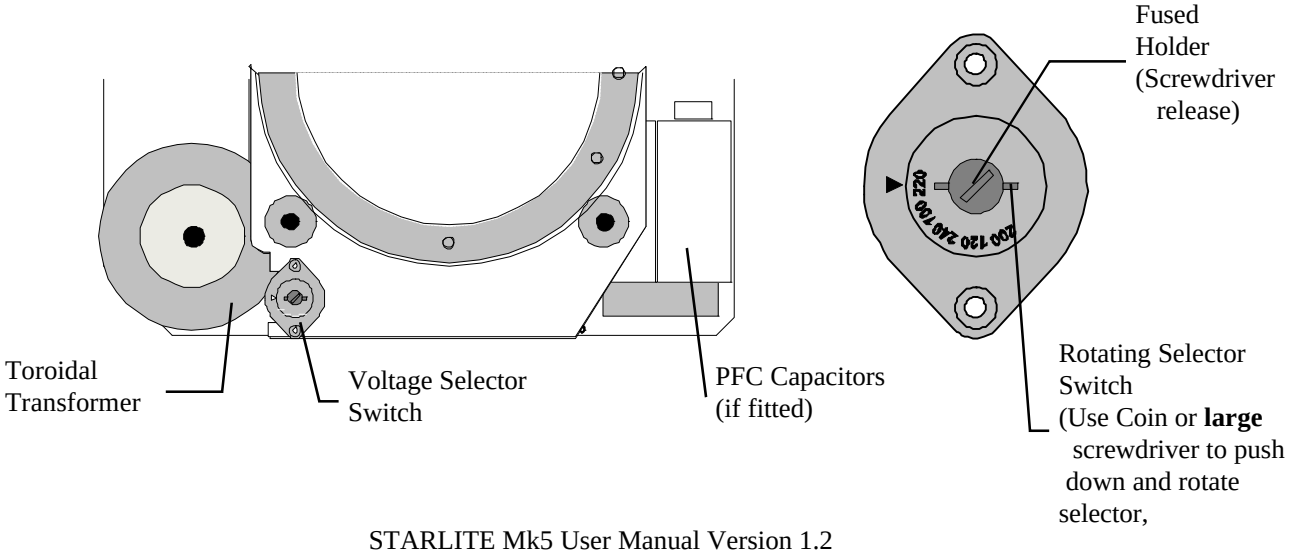
Ensure that the unit is unplugged from the mains supply before removing the base covers.

To change the selector switch:

The voltage selector switch is located next to the toroidal transformer, in the base of the unit, above the input connector panel (***See*** diagram below)

Using a medium sized flat bladed screwdriver, first remove the centre fuse holder complete with the fuse. Then with a small coin (5p, 10¢, 5¥ etc.) or large flat bladed screwdriver, push down and rotate the selector dial to the desired voltage range. Replace the central fuse holder and fuse.

Note: If the local voltage does not exactly match any of the values on the selector dial, use the nearest lower value. E.g. Local voltage = 230 Volts. Set switch for 220 Volt selection.



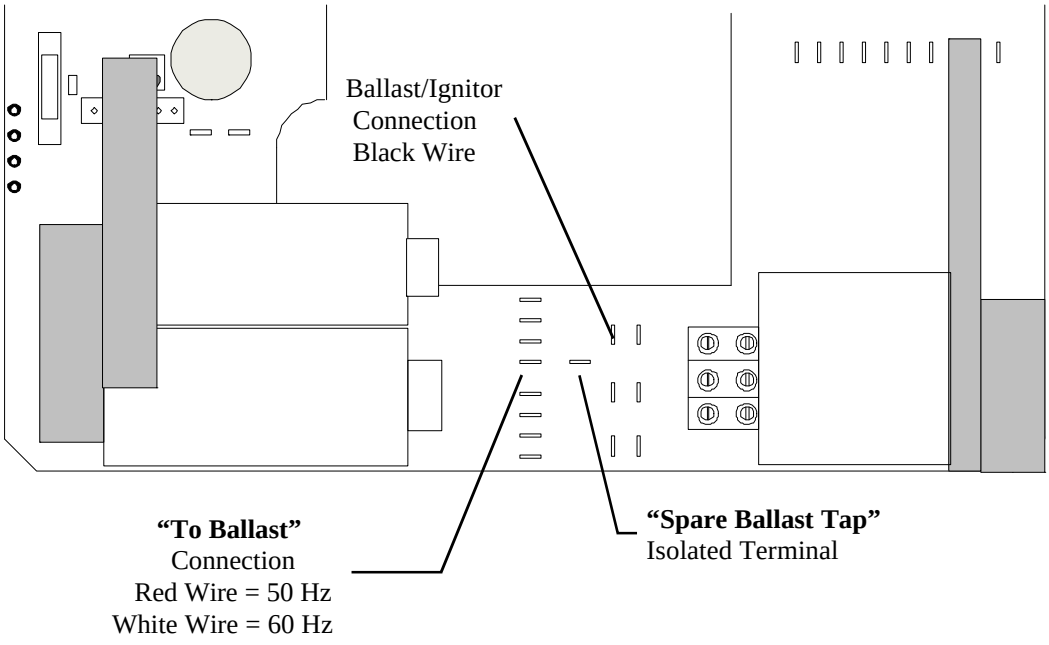
Lamp Ballast Voltage/Frequency Selection

Magnetic Ballast Version

CAUTION: This section of the base has EXPOSED LIVE PARTS and LETHAL VOLTAGES and ENERGIES present. Ensure the unit is switched OFF and DISCONNECTED from the mains supply BEFORE working in this area.

Earlier Models:

There is a 50 / 60 Hertz tap for the magnetic ballast supply located between the power factor correction capacitors and the lamp ignitor. These are either (1)¼ inch spade connectors or, (2) soldered connections, with the Red wire being 50 Hertz and the White wire, 60 Hertz. The unused tap should be moved onto the 'SPARE BALLAST TAP' terminal and the selected tap applied to the terminal marked 'TO BALLAST' on the 4 way 'LIVE' block. Care should be taken to ensure the correct settings are applied for the location.



Current Models:

On the latest models, although the wiring is basically the same, all of the connections have been changed to PCB mounted screw terminals.

Electronic Ballast Version

The Switch-Mode Power Supplies fitted to both the 575 W and the 1200 W versions do not require adjustment when used within the specified Voltage/Frequency limits.

i.e. 95-130 and 200-250 Volts, 47-65 Hz

The Yoke

The yoke is secured to the pan ring gear and provides the routing, from the static base to the moving head, for the various wiring looms. Also located on the yoke assembly is the tilt position sensor, which can be accessed by removing the plastic cover (***See*** "Adjusting Tilt Position Sensor") if adjustment/resetting is required.

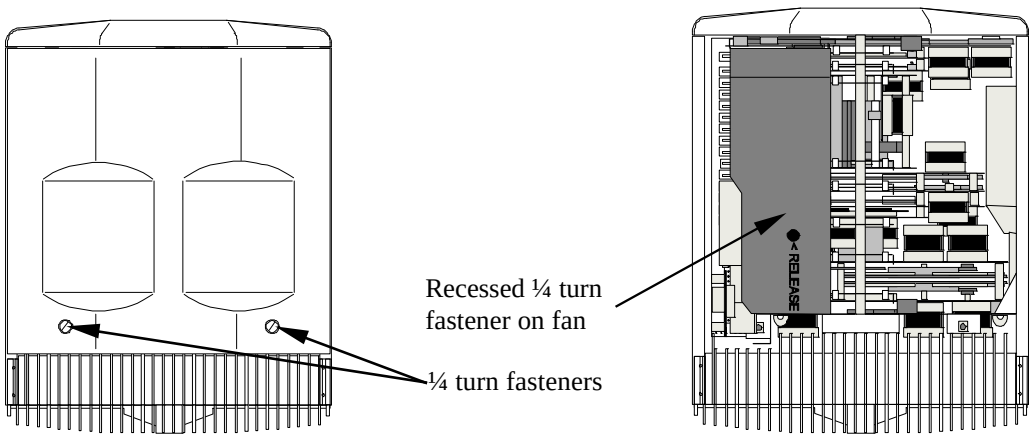
The Head

The head contains the lamp housing, tilt motor, function modules, decoder and function drive cards and the head cooling system. To gain access inside the head it is necessary to remove one (or both) of the head covers by undoing the two ¼ turn fasteners on each cover.

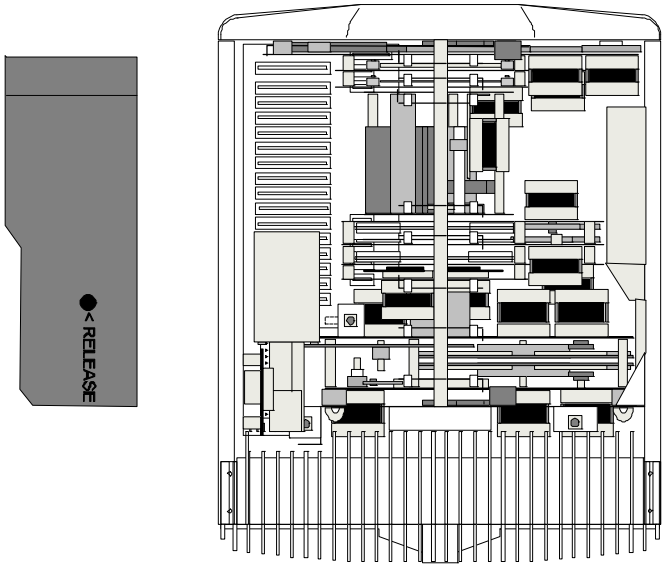
"Fan" Side of the Head (Earlier models)

With pan in its mid (neutral) position, removing the cover on the cable/connector side, will give you access to secondary fan module, some of the cards below it and allow the changing of gobos etc. The fan module is removed by undoing the ¼ turn fastener located thru the "Release" hole and unplugging the fan module (if necessary).

When replacing the fan module/card retainer ensure that you re-plug the fan power connector.



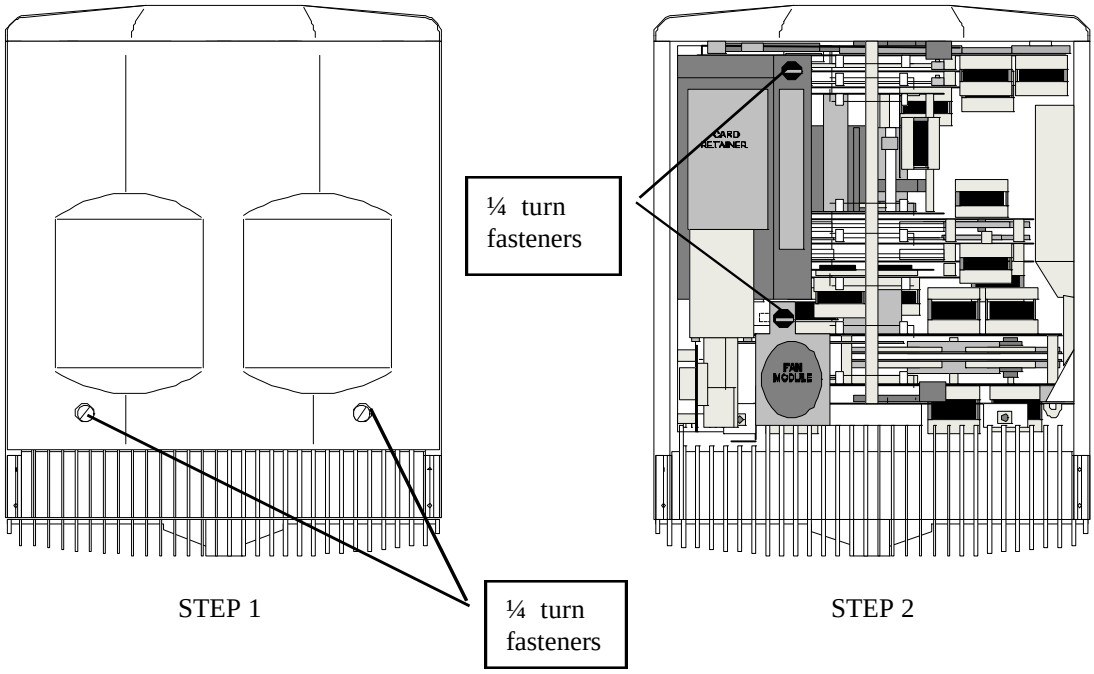
Step 1 **Step 2**



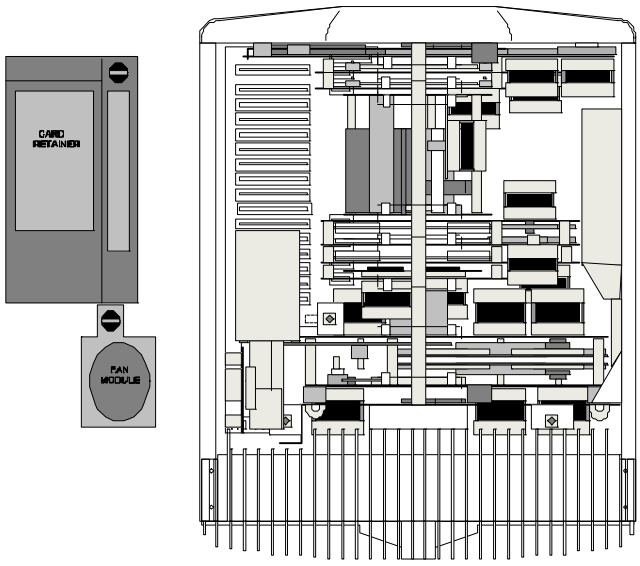
“Fan” Side of the Head (Current models)

With pan in its mid (neutral) position, removing the cover on the cable/connector side, will give you access to secondary fan module, the card retainer (and cards below it) and allow the changing of gobos etc. The card retainer can be removed by , (1) undoing the ¼ turn fastener on the secondary fan module and moving the fan to one side, (2) undoing the ¼ turn fastener on the card retainer and it lifting away from the unit.

Note:- On the latest models, a flexible safety wire connects each head cover to the main frame of the head . It is recommended that you **do not** disconnect this safety wire **unless** you cannot get enough access to the head with it in place

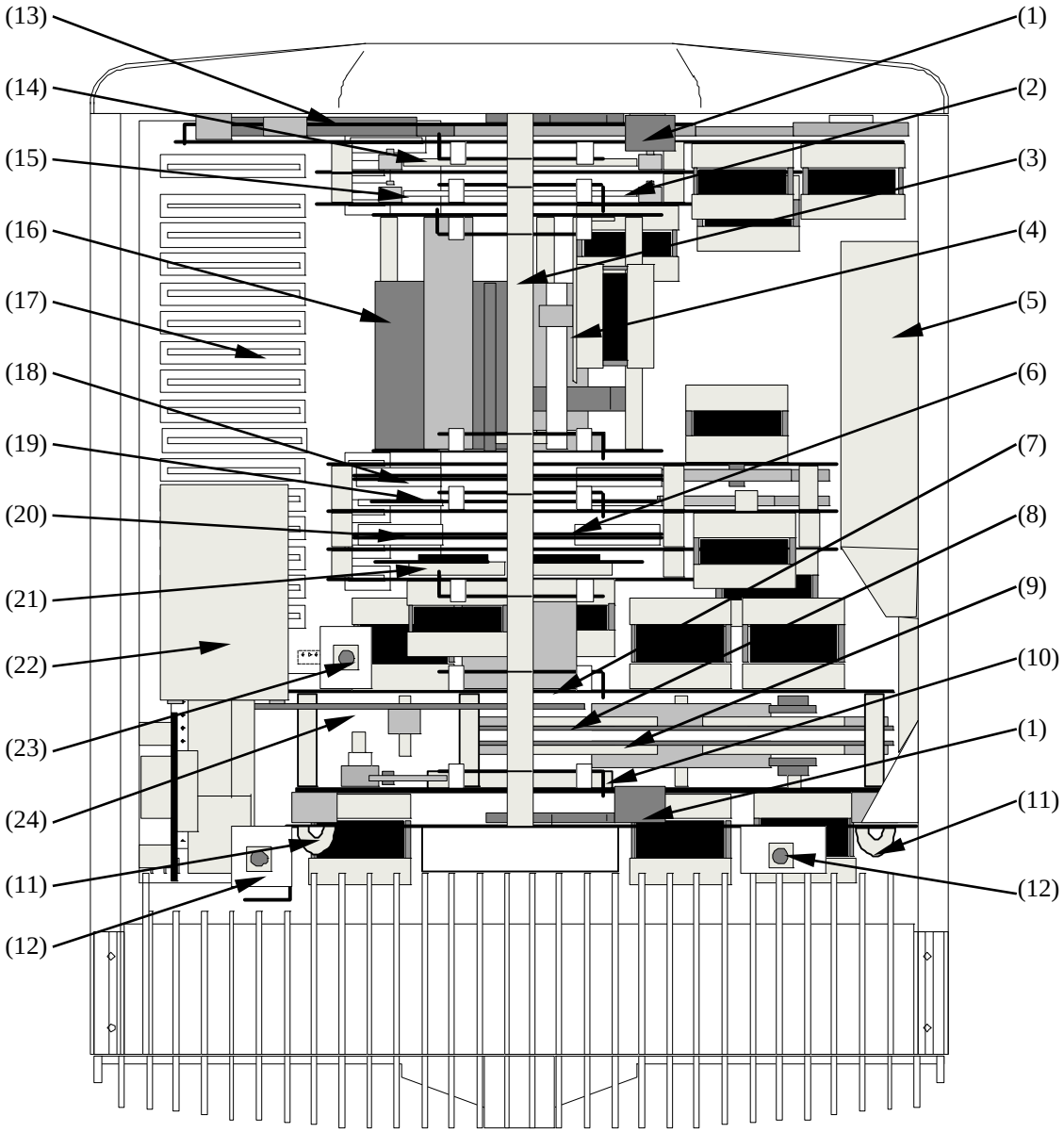


STEP 1 STEP 2



STEP 3

Open view of the Head (Fan side)



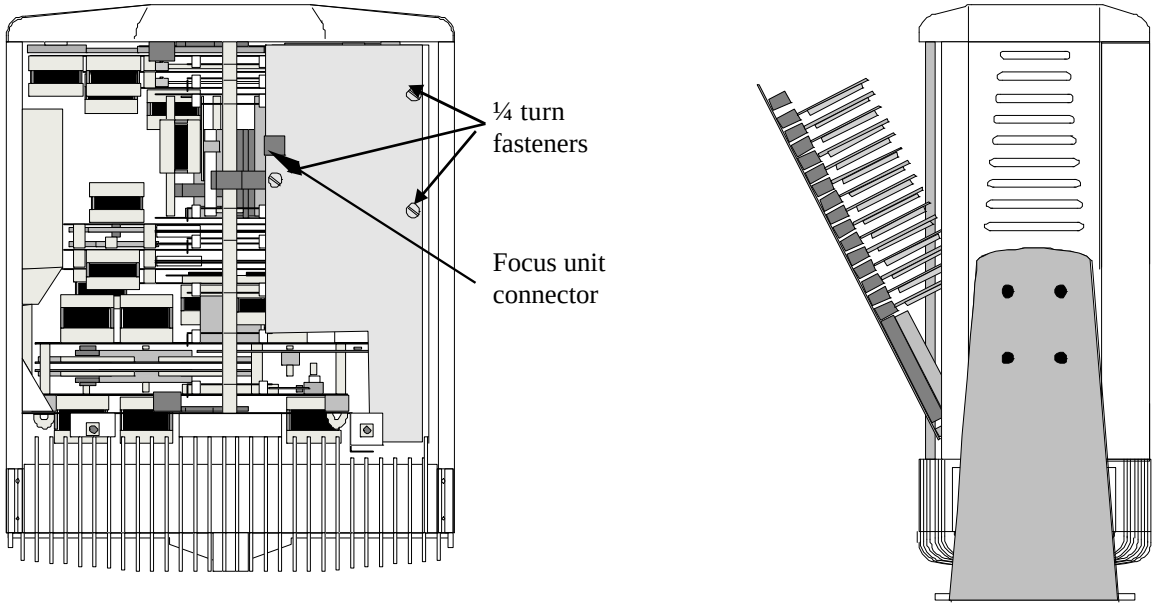
Secondary fan unit, card retainer and daughter cards not shown for reasons of clarity

(1)	Retaining bar clamp (2 off)	(13)	Prism section
(2)	Prism, frost and dim module	(14)	Frost section
(3)	Retaining bar	(15)	Dimmer section
(4)	Focus module	(16)	Triplet lens carrier
(5)	Main cooling fan	(17)	Head motherboard and cards
(6)	CMY and shutter module	(18)	Magenta colour section
(7)	Gobo, iris and colour wheel module	(19)	Cyan colour section
(8)	Rotating gobo wheel	(20)	Yellow colour section
(9)	Rotating gobo wheel	(21)	Shutter section
(10)	Iris	(22)	Tilt motor assembly
(11)	Gobo module retaining clip (2 off)	(23)	Secondary fan retaining clip
(12)	Head cover retaining clip (2 off per side)	(24)	Colour wheel

“Motherboard” Side of the Head

To access all the function drive cards, and to remove modules, it is necessary to remove the head covers on the “Motherboard” side and release the motherboard from its fixings and ease it away from the modules.

To release the motherboard, unplug the decoder card and allow it to hang on the address switch cable, unplug the focus unit and then undo, and remove, the three ¼ turn fasteners and **gently** prise the motherboard away (starting at the front of the head) from the modules. This action will disengage the module edge connectors from their sockets on the motherboard and allow the motherboard to fall forward giving access to the drive cards that are located under the tilt motor.



Note: Please take care not to stretch the cable looms that are connected to the motherboard.

Lamp Housing

The finned lamp housing at the rear of the unit head contains the HMI lamp (575 W or 1200W) and the safety interlock system, which ensures safe operation of the metal halide arc lightsource.
The fins on the lamp housing are designed radiate away part of the excess heat generated by the lamp, thereby reducing the amount of forced air cooling required. This design allows the use of high wattage lamps without excessively noisy cooling fans.

<u>Please Note:</u> The fins on the lamp housing get extremely hot during normal operation of the unit. Please allow sufficient cooling time before commencing any work on the unit.

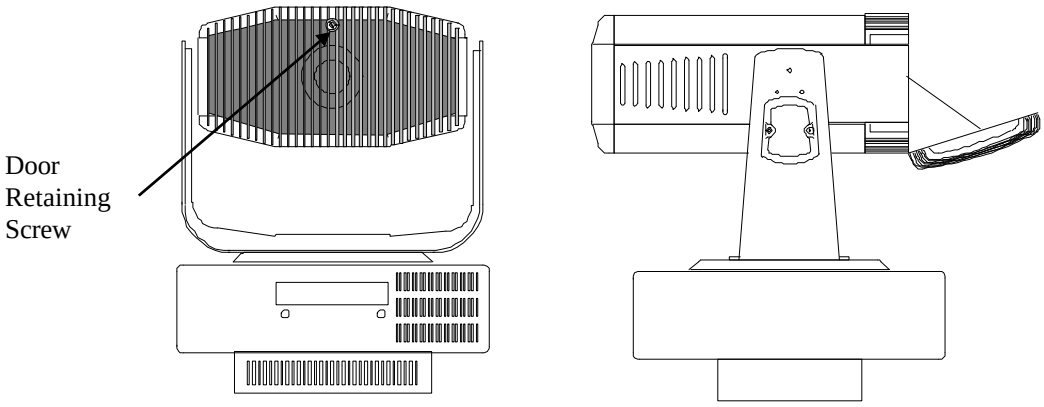
The lamp housing has a safety interlock system that will automatically extinguish the lamp if the rear access door is inadvertently opened during normal operation. This safety interlock is there to protect against the high voltages, high temperatures and high levels of Ultra-Violet radiation present when the HMI lamp is operating **and should not be tampered with or altered in any way.**

To Install or replace the lamp

You will require the following:

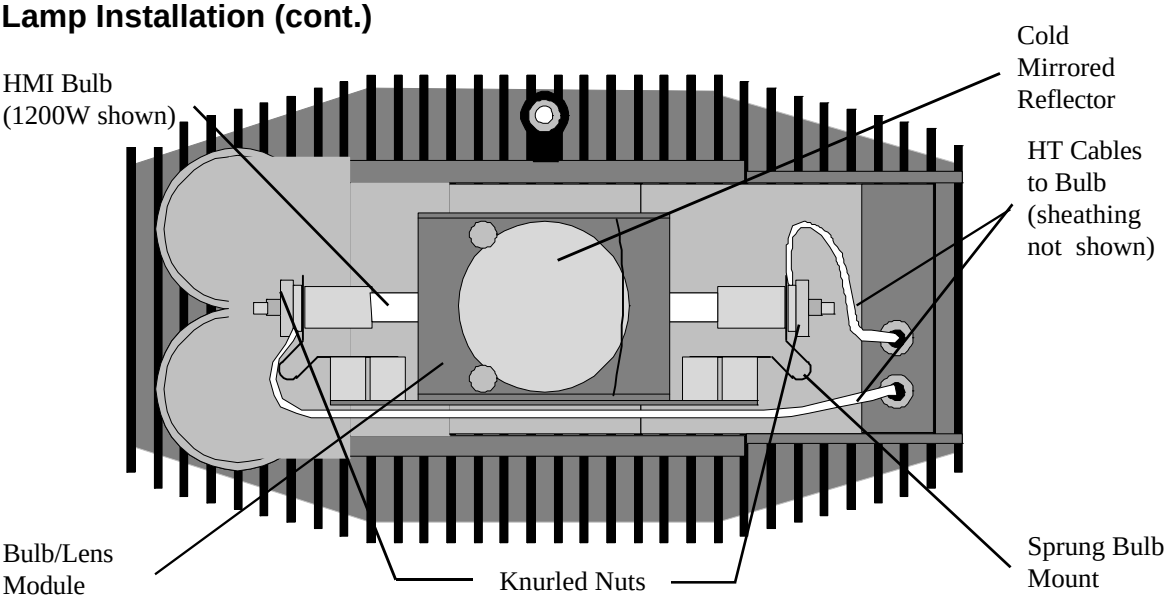
- Flat bladed screwdriver (8mm wide tip)
- Osram (or equivalent) HMI 575 or 1200W Lamp depending on unit type. (***See*** base label)
- Face / Eye protection
- Gloves

1) Switch off the unit and disconnect the power cord from the mains supply.
2) Stand the unit on a suitable surface and ensure that it has been allowed to cool down.
3) Manually tilt the unit head so that the finned lamp box retaining screw is to the top and the rear door hinges to the bottom.
4) Using the correct screwdriver, undo the retaining screw and gently lower the lamp box door until it is resting on the safety stay.

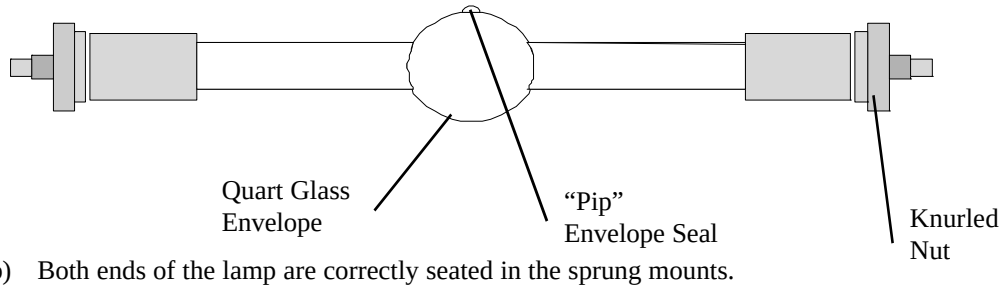


5) Wearing suitable hand and eye protection, lightly grip one of the metal ends of the lamp envelope and completely unscrew the knurled nut.
6) Loosely replace the nut.
7) Repeat step 5 above for the other end of the lamp.
8) Hold onto the metal frame of the lamp / lens module and ease the module away from its mounting / locating studs by gently pulling backwards. When free, rest the module on the back door.

Lamp Installation (cont.)



8) With great caution, (***See*** manufacturers safety notes for correct handling of Metal Halide Lamps) remove the old lamp by lifting upwards to clear the sprung mounting supports and then tilting one end up before extracting the lamp sideways from the carrier. Take care not to strike the quartz envelope against any hard metal surface. Store the used lamp safely (preferably in its original packaging) and dispose of safely according to local regulations.
9) Remove the new lamp from its packaging and if necessary clean the quartz envelope using the cleaning cloth supplied with the replacement lamp, following the lamp manufacturers guide to cleaning.
10) Replace the new lamp by reversing the above procedures (8 – 4).
    Ensure the following:
    a) The 'Pip' (Envelope seal) of the lamp is not in the direct optical path.
       i.e. **<u>Do not place the 'Pip' towards either the lens or the rear reflector.</u>**



    b) Both ends of the lamp are correctly seated in the sprung mounts.
    c) The knurled nuts securing the lamp and its power connections are fully tightened.
11) Re-seat the lamp / lens module by reversing procedure 5 above. Make sure that the module is correctly located on the spigots and pushed fully forwards so that it locates flat against the lamp housing.
12) Ensure that the lamp cables and their fibreglass sheathes are placed correctly so that they do not obstruct the closure of the rear door or contact the quartz envelope of the lamp unit.
13) Gently close the back door ensuring that the safety stay retracts back into its enclosure and secure the door retaining screw. You may hear an audible click as the safety interlock switch is reactivated.
14) If you have followed the above instructions, the unit should now be ready for use.

Note: The fibreglass sheathing covering the HT Cables will turn white due to the UV light. This is normal and will not effect its working properties.

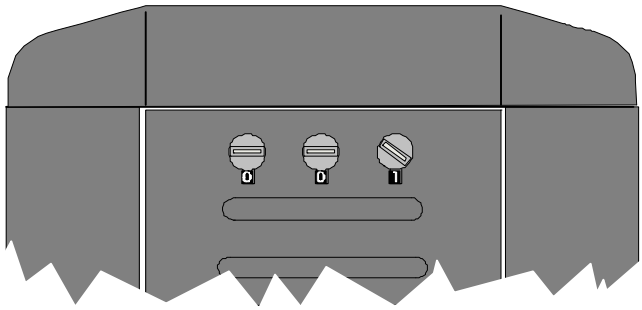
Warning: Whenever you are working on or near the lamp, wear protective eyewear and gloves. An operating unshielded lamp emits ultraviolet and visible radiation, which could damage eyes and skin.

Setting the DMX Start Address BCD Switches

The DMX offset address switches are located on the outside front of the head frame. There are 3 rotary switches that are accessible using a small bladed screwdriver or similar tool. Lamp addressing starts from address 1 with address zero reserved for self-test mode.
The Starlite Mk5 unit can be addressed with any start address.
Each unit requires a maximum of 19 DMX channels depending on the function specification.

Example address mapping for 19 channel configuration (one DMX string of 512 channels):

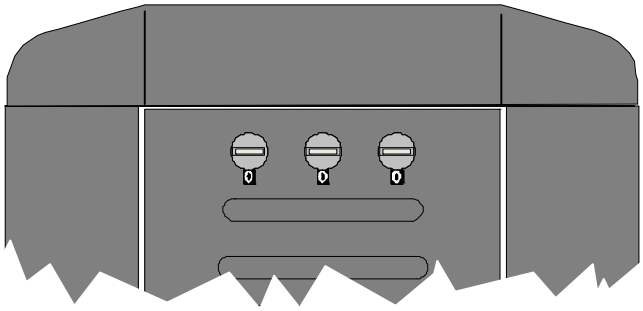
Lamp 1 *Start Address 001*
Lamp 2 *Start Address 020*
Lamp 3 *Start Address 039*
Lamp 4 *Start Address 058*
.
.
.
Lamp 26 *Start Address 476*



Note: Address settings will only take effect when there is no DMX signal present. To modify the address for a unit, first set the desired start address and then remove the DMX signal for 2 seconds prior to replacing.

Self Test Mode

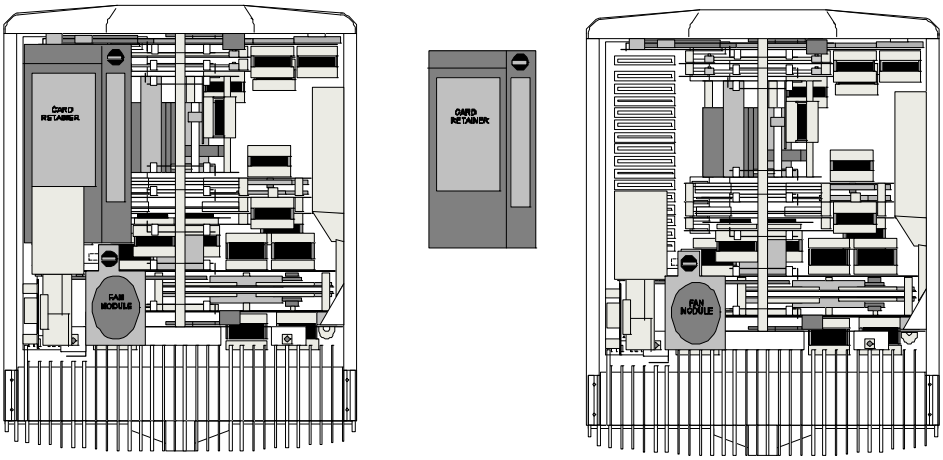
Set the DMX address to zero to activate self-test mode.
(the lamp will also strike if enabled. ***See***: Two way switch).



The unit will then move the Pan and Tilt functions to their mid positions and then sequence through the various lamp head functions until a valid DMX Start Address is set and at least one sequence has been completed.

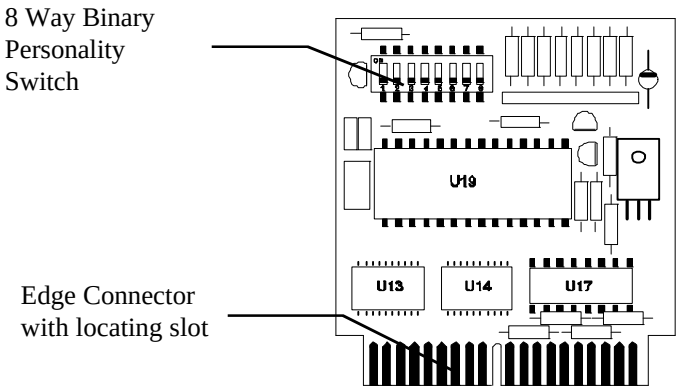
Setting the Drive Card DIP Switches

The decoder and drive cards can be accessed by first removing the unit head covers and the secondary cooling fan module (or card retainer) which can be removed by unlatching the quarter turn fasteners. Now unplug the fan module(or remove card retainer) and place aside. You now have access to the decoder and drive cards. (***See***: "Fan" side of head)

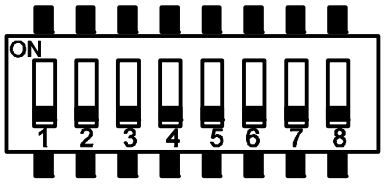


Drive Card DIP Switches

All head function drive cards are identical and can be used to control any of the various head functions. The 8-way DIP Binary personality switch is split into two halves. Switches 1 to 4 set the Drive function and switches 5 to 8 set the internal DMX address for the head functions.
Note: These switches are factory set to the standard personality listed below.



STARLITE Mk 5 DRIVE CARD (Issue 3)



Drive Functions | Internal DMX Address

8 way DIP switch

Drive Card Address Information

Drive card position	Function name	Function binary address	Factory set DMX address
1	Prism rotate	0101	1101
2	prism	1001	1101
3	Frost	1101	0011
4	Dimmer	0110	0111
5	Focus	0001	1001
6	Gobo wheel 2	0100	0110
7	Gobo wheel 2 rotate	1100	1010
8	Colour wheel	1000	1000
9	Gobo wheel 1	0100	0001
10	Magenta	0000	1100
11	Cyan	0000	0100
12	Yellow	0000	0010
13	Shutter	1110	1011
14	Iris	1010	0101
15	Gobo wheel 1 rotate	1100	1110

For convenience, this table is also printed on the cover of the secondary fan module/card retainer.

Function Address

This part of the switch sets the type of drive curve that the card will give for a certain function. e.g. A card that is driving a gobo wheel requires a different drive curve to one that is driving the shutter. These settings should not be changed unless your are:

(1) replacing a card (when you should set the card function address to be the same)

(2) installing a different type of module in that part of the lamp (function address instructions will be given with the new module)

DMX Address

This part of the switch sets the internal DMX address of each drive card in relation to the overall personality of the unit. These are factory set to the default Starlite Mk 5 Personality but they can be altered, allowing the unit to be configured to the personality required. e.g. The same as other moving lights in the system.

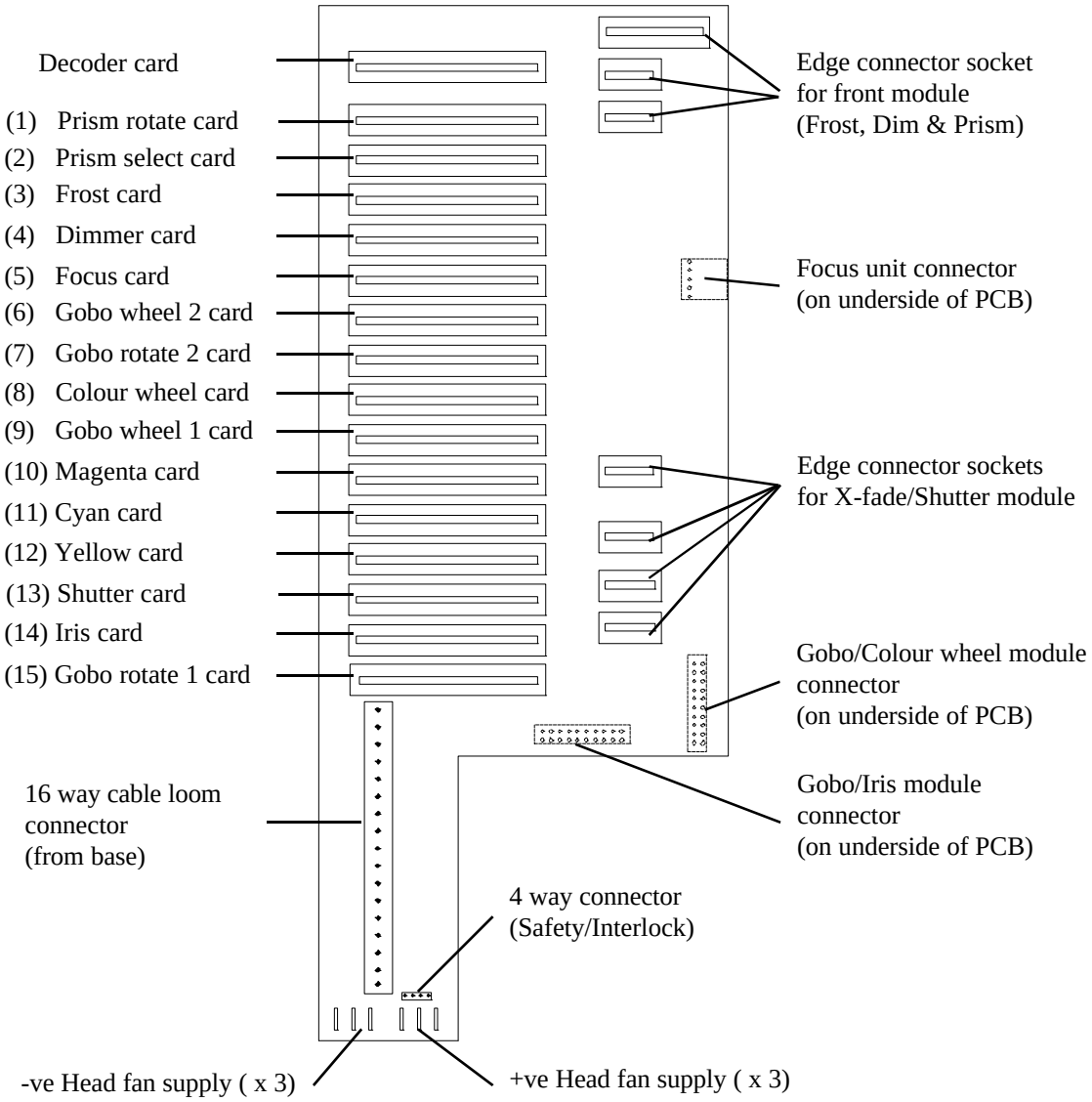
(***See*** Factory Set Personality)

Note: Pan and Tilt DMX address cannot be re- assigned and are permanently set to the first 4 channels of the decoded DMX signal. E.g. Unit DMX start address set to channel 101 will have Pan on channels 101 to 102 and Tilt on Channels 103 to 104. DMX channels read by the Head Function Drive Cards will always start from the 5th decoded channel. Therefore if the card driving the colour wheel is set to channel 1, then the colour wheel will respond to the 5th channel from the unit DMX start address.

When replacing the fan module ensure that you re-plug the fan power connector.

Drive card motherboard positions

The motherboard, which is located in the head of the unit, has 15 drive card slots and one decoder card slot. The connector which is nearest to the front of the lamp head is for the decoder card and slots 1 to 15 are for the drive cards. These 15 slots correspond to the various functions function positions and are allocated as follows:


Decoder card
(1) Prism rotate card
(2) Prism select card
(3) Frost card
(4) Dimmer card
(5) Focus card
(6) Gobo wheel 2 card
(7) Gobo rotate 2 card
(8) Colour wheel card
(9) Gobo wheel 1 card
(10) Magenta card
(11) Cyan card
(12) Yellow card
(13) Shutter card
(14) Iris card
(15) Gobo rotate 1 card
Edge connector socket for front module (Frost, Dim & Prism)
Focus unit connector (on underside of PCB)
Edge connector sockets for X-fade/Shutter module
Gobo/Colour wheel module connector (on underside of PCB)
Gobo/Iris module connector (on underside of PCB)
16 way cable loom connector (from base)
4 way connector (Safety/Interlock)
-ve Head fan supply (x 3)
+ve Head fan supply (x 3)

STARLITE Mk 5 Motherboard (Issue 3)

N.B. In current models the head fan and Safety/Interlock connections are combined in one 8-way connector.

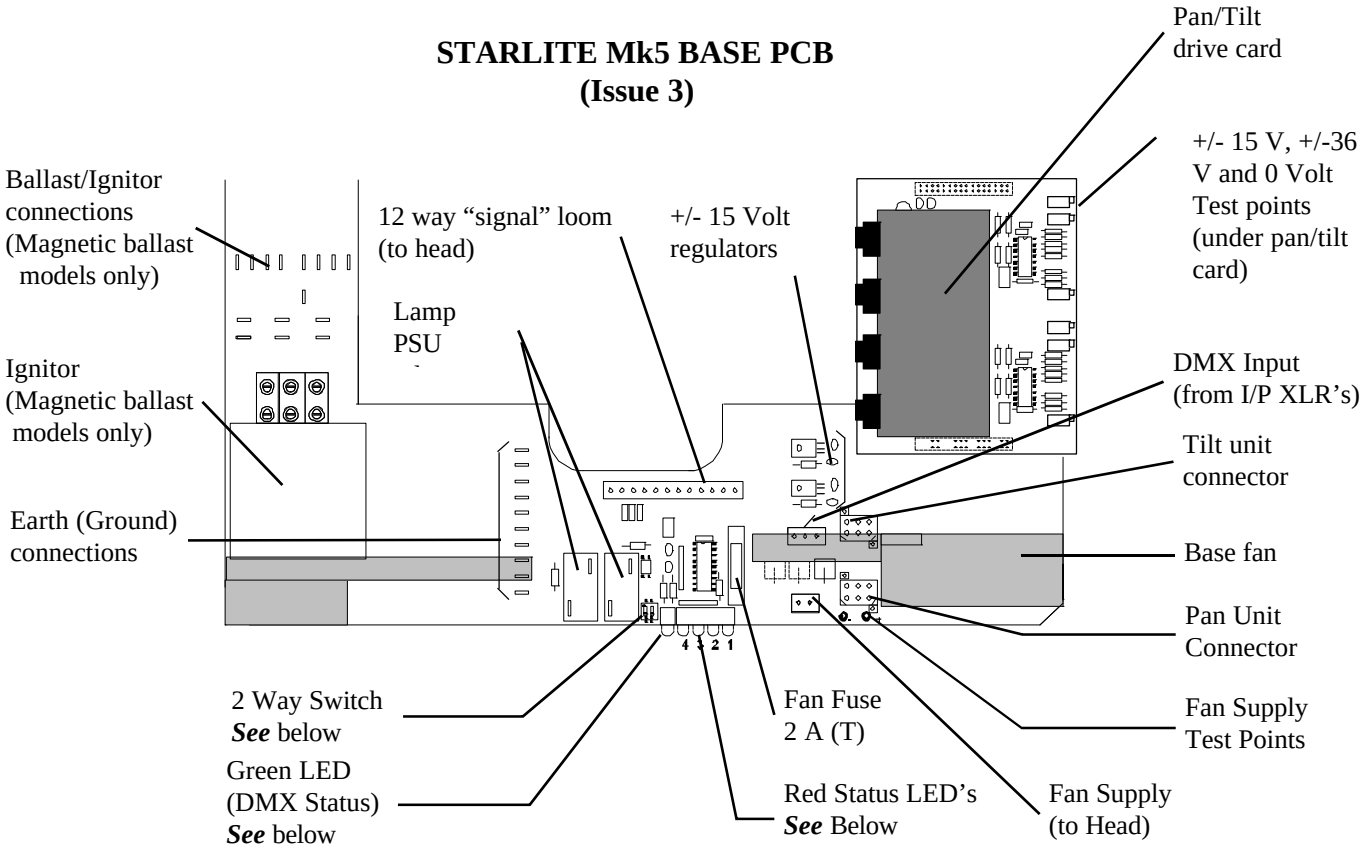
Please do not attempt to remove the drive cards whilst the unit is powered up.

Unit Review (cont.)

Front (Indicator) Side of the Base

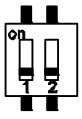
After ensuring the unit is switched off and disconnected from its power source, remove the three hex screws, one on the front of the lamp and one on each side, and gently pull the cover away from the lamp base.
Note: There are two hex screws on each side of lamp**, but only one may be removed from each side, the others are captive.**
If required, you can now unclip the cover safety wire and disconnect the screening cable.

STARLITE Mk5 BASE PCB
(Issue 3)


Pan/Tilt drive card
+/- 15 V, +/-36 V and 0 Volt Test points (under pan/tilt card)
Ballast/Ignitor connections (Magnetic ballast models only)
12 way "signal" loom (to head)
+/- 15 Volt regulators
Lamp PSU
Ignitor (Magnetic ballast models only)
DMX Input (from I/P XLR's)
Tilt unit connector
Earth (Ground) connections
Base fan
Pan Unit Connector
4 3 2 1
2 Way Switch *See* below
Fan Fuse 2 A (T)
Fan Supply Test Points
Green LED (DMX Status) *See* below
Red Status LED's *See* Below
Fan Supply (to Head)

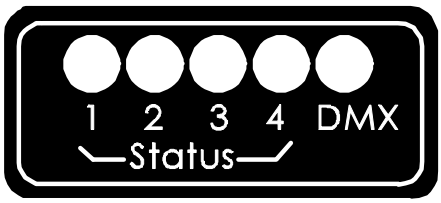
2 Way Switch

There are two switches located between the lamp power PSU relays and the status LED's. Switch 1 is used to disable the 2 minute time-out when a DMX signal is removed and switch 2 is used to inhibit the lamp strike during testing. The normal status for these switches is as follows:



Switch Status	Switch 1	Switch 2
Lamp Strike Enabled 2 minute time out Enabled	Off	On
Lamp Strike Enabled 2 minute time-out Disabled	On	On
Lamp Strike Disabled	N/A	Off

Status LED's



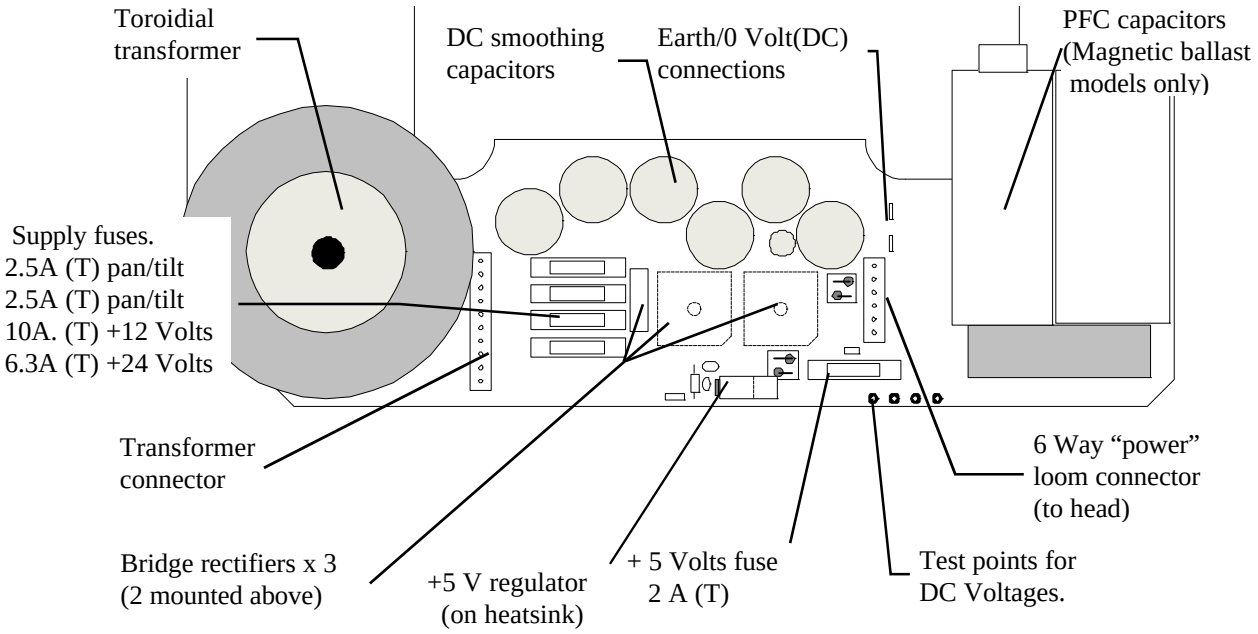
Unit Status	Status 1	Status 2	Status 3	Status 4	Green LED (DMX)
Power Up, No DMX	Off	Off	Off	On	On
Valid DMX Signal	Off	Off	Off	Flash until lamp strike (5 Sec's)	Off
DMX removed	Off	Off	Off	Slow Flash for 2 Mins before Lamp switched off	On
Cooling down after lamp switched off	Off	Slow Flash Alternating with LED 4 (3 mins)	Off	Medium flash Alternating with LED 2 (3 mins)	On or off depending on DMX status
Lamp Strike Enabled 2 minute time out Enabled	Off	N/A	Off	N/A	N/A
Lamp Strike Enabled 2 minute time-out Disabled	On	N/A	Off	N/A	N/A
Lamp Strike Disabled	N/A	N/A	On	N/A	N/A
Interlock Failure	N/A	N/A	N/A	On	N/A

Note:
During the cool down period with LED's 4 and 2 flashing, it is not possible to re-strike the unit by applying valid DMX for 3 minutes. If DMX is applied, the unit will re-strike after this 3 minute sequence.

Rear (DC Supply) Side of Base

This side of the base contains the transformer, rectification circuits and fuses which supply and protect the DC Voltages used by the motors, logic circuits etc.

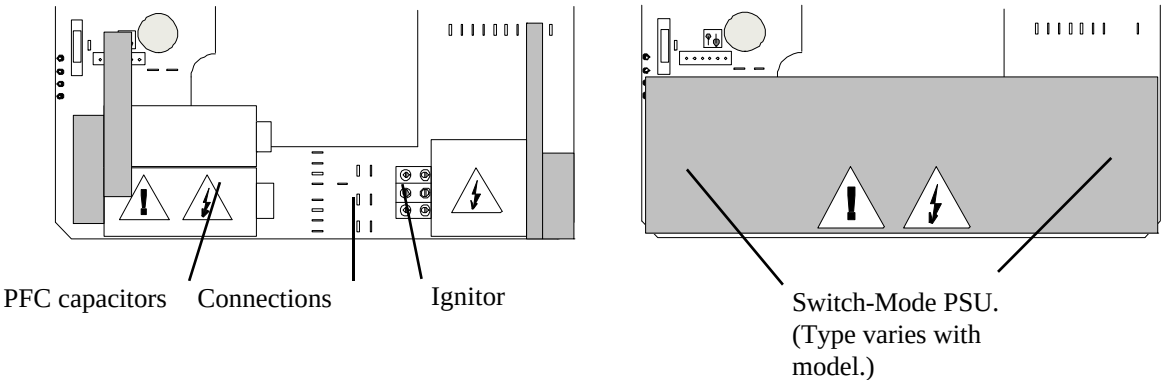
STARLITE Mk5 BASE PCB (Issue 3)


Toroidial transformer
DC smoothing capacitors
Earth/0 Volt(DC) connections
PFC capacitors (Magnetic ballast models only)
Supply fuses.
2.5A (T) pan/tilt
2.5A (T) pan/tilt
10A. (T) +12 Volts
6.3A (T) +24 Volts
Transformer connector
6 Way "power" loom connector (to head)
Bridge rectifiers x 3 (2 mounted above)
+5 V regulator (on heatsink)
+ 5 Volts fuse 2 A (T)
Test points for DC Voltages.

Lamp PSU Side of the Base

This area of the base contains either;
(1) the Ignitor and PFC capacitors in magnetic ballast models
or,
(2) the SMPSU in electronic ballast models.

CAUTION: This section of the base has EXPOSED LIVE PARTS and LETHAL VOLTAGES and ENERGIES present. Ensure the unit is switched OFF and DISCONNECTED from the mains supply BEFORE working in this area.



In magnetic ballast models, this area also contains the two different frequency taps for the ballast.
***See* "Setting the Starlite Mk5 unit Voltage"**

Servicing the Starlite MK5

General Maintenance and Cleaning

The Starlite MK5 should be cleaned on a regular basis to maintain performance and reliability. As a guide the Starlite MK5 should be cleaned at every lamp change to maintain peak performance. Always turn off the power/unplug the unit before commencing the cleaning procedure and allow sufficient time for the unit to cool down (20 minutes).

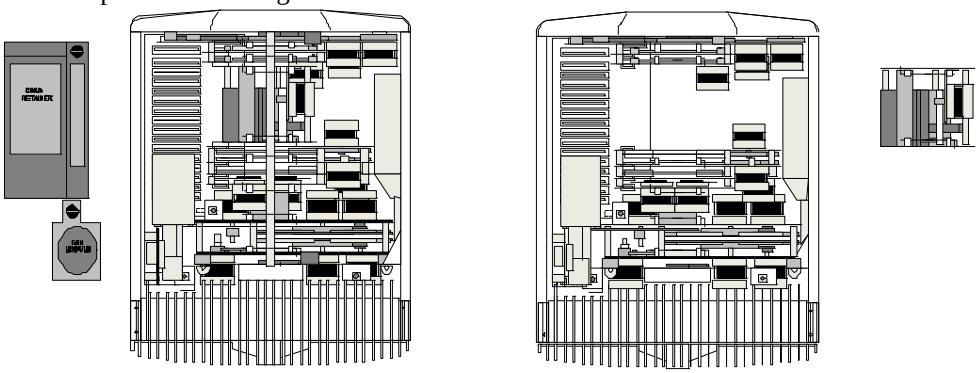
Cleaning the external surfaces

Wipe with a soft cloth and some anti-static foam cleaner to remove dust/dirt build up.

Removing and Cleaning the Internal head Components

Removing Head Modules

1. All head components can be accessed by first removing both the head covers by unlatching the quarter turn fasteners.
2. Manually tilt the units head so that the finned lamp housing retaining screw is to the top and the rear door hinges to the bottom.
3. Remove (1)the secondary fan and (2)card retainer by releasing the ¼ turn fasteners.
4. Release the two centre bar retaining clamps located at the front and rear end of the centre bar and lift the bar upward on its hinges.

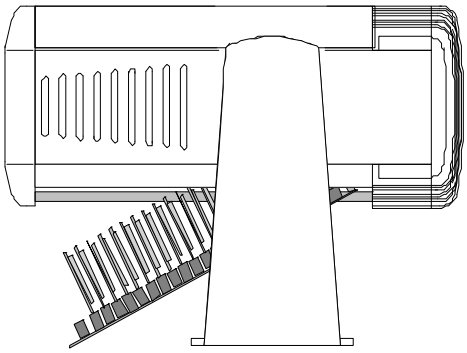


Removing the Focus Module

5. Unplug the focus unit by removing the connector located on the solder side of the head motherboard.
   N.B. Current models have a 6-way connector on the focus module and are therefore not interchangeable with the earlier modules which have a 5-way connector.

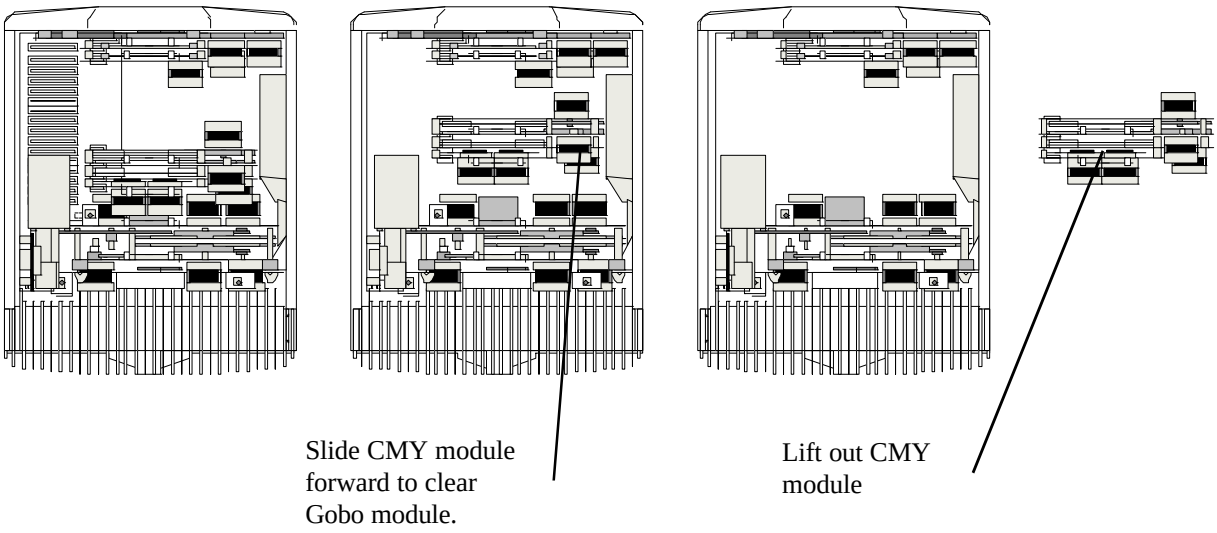
Removing the Motherboard

6. Remove the three-quarter turn fasteners from the motherboard and unplug the two 20 way ribbon cables located at the rear of the board.
7. Unplug the decoder card from the first socket and leave in the head, connected to the DMX address switch.
8. Push down from the top component side until the motherboard unplugs from the head modules.



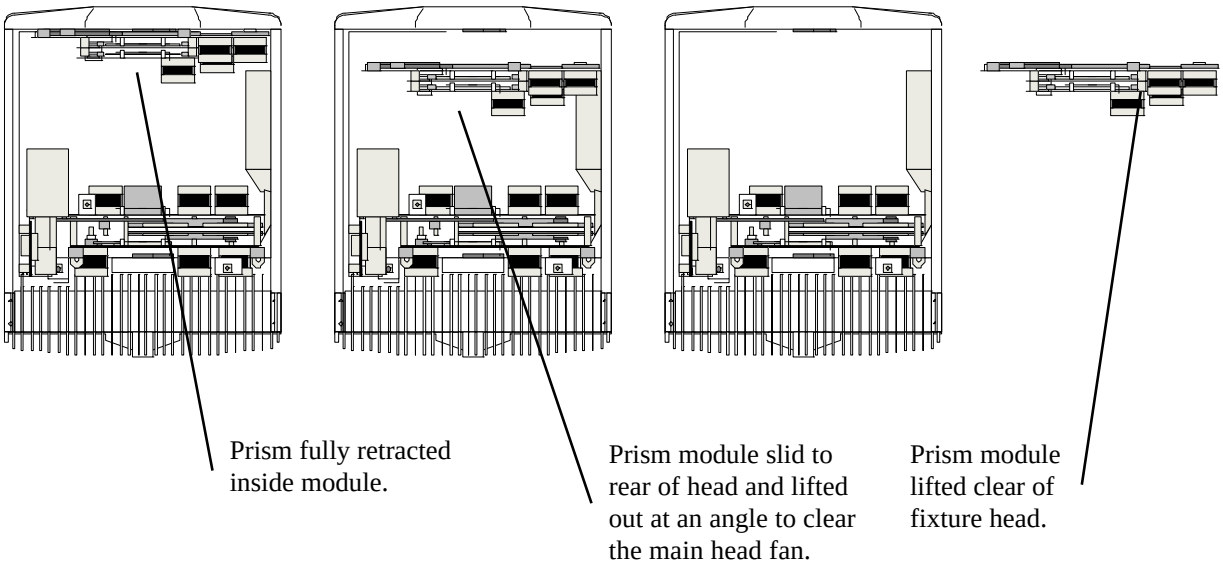
Removing the CMY Module

9. Slide the CMY colour fading module towards the front of the lamp and lift out.



Removing the Prism Module

10. Make sure that the prism is fully retracted and then slide the module towards the rear of the lamp and lift out at an angle to clear the main cooling fan.

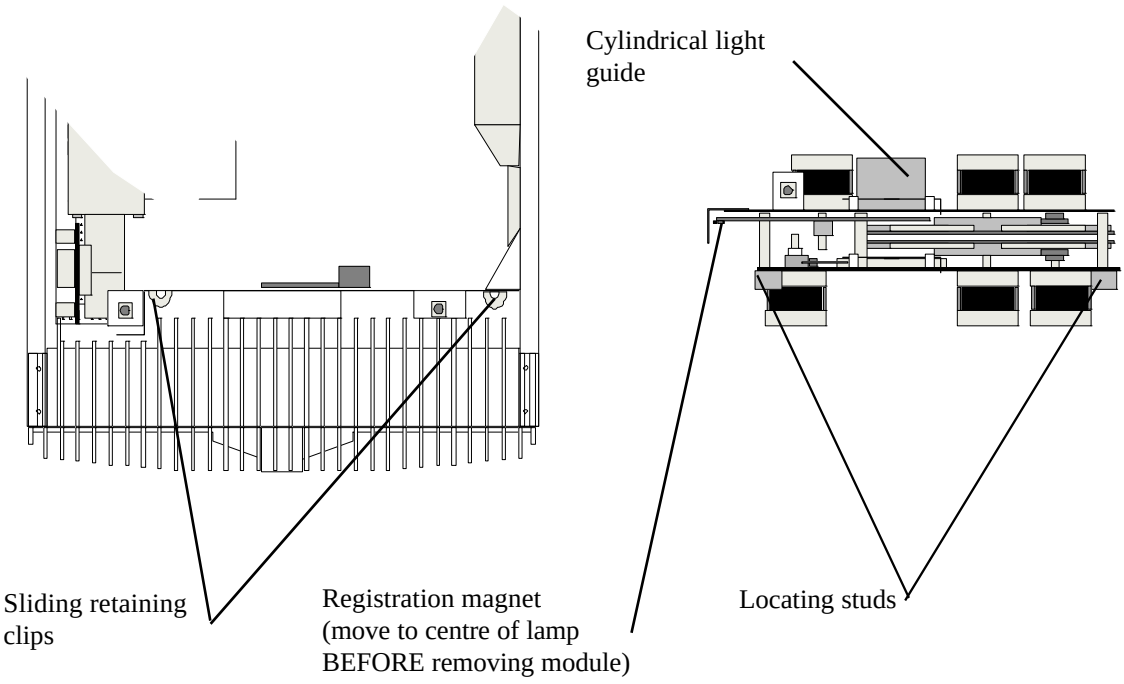

Prism fully retracted inside module.
Prism module slid to rear of head and lifted out at an angle to clear the main head fan.
Prism module lifted clear of fixture head.

Important

When replacing any of the modules, please ensure the spring wires (at the top and bottom of each module) locate in the grooves cut into the two retaining bars. This ensures the optimum optical alignment of the different modules in the lamp.

Removing the Gobo Module

11. **It is not recommended that you remove the gobo module but should it be necessary, use the following procedure.**
    The gobo modules are retained by two studs which locate into sliding clips located between the rear lamp housing plate and the finned lamp housing.


Cylindrical light guide
Sliding retaining clips
Registration magnet (move to centre of lamp BEFORE removing module)
Locating studs

12. Using a small pair of long nose pliers, grip the hole in the retaining clip and pull upwards until the stud is released and slide the gobo module towards the front of the lamp ensuring that the top of the module is tilted more towards the front of the lamp.
13. **Do not hold the gobo module by the cylindrical light guide**
14. When the stepper motors clear the rear lamp housing plate, continue to tilt slightly forwards and downwards on the colour wheel side. Care should be taken to ensure that the colour wheel does not foul on the tilt motor assembly and that the colour wheel is rotated to move the registration magnet towards the centre of the lamp for protection.

Note: After replacing this module, rotate the gobo and colour wheels to locate the magnets over their respective Hall effect sensors. Ensure that the magnets sit between 2mm and 3 mm from the surface of the sensor to guarantee activation.

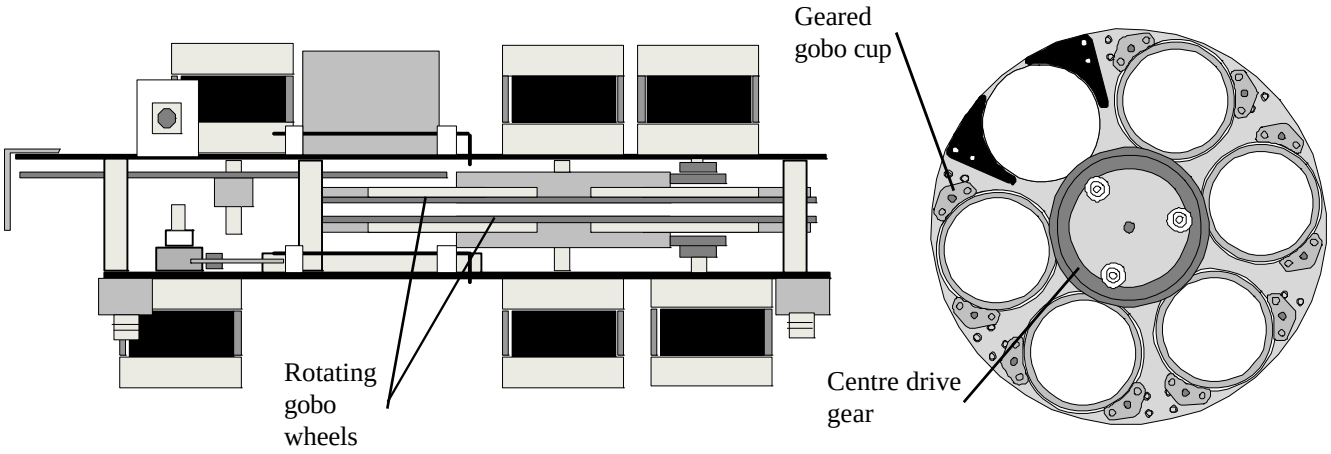
Important

When replacing any of the modules, please ensure the spring wires (at the top and bottom of each module) locate in the grooves cut into the two retaining bars. This ensures the optimum optical alignment of the different modules in the lamp.

Cleaning Head Modules

Cleaning Rotating gobos

The rotating gobo gears should be periodically lubricated using a high temperature synthetic oil lubricant with added PTFE. This should be applied to the main centre drive gear teeth and the bearing surface of the individual cups whilst the gears are rotating. Excess oil should be removed using a lint free cloth with the cups stationary.



Cleaning Cross Fade Colours

Use a lint free cloth and suitable non-staining glass cleaner to gently wipe over the colour filters in the cross fade module and colour wheel. Take care to:

1. Ensure that you do not remove the anti-reflecting strip on the leading edge of the CMY colour blades.
2. Do not use excessive pressure when cleaning the blades or you will distort the filter carriers.

Cleaning the Triplet Lens

The Triplet lens can be easily cleaned, without removing it from the focus module.

1. Remove focus module from the unit,
2. Slide Triplet lens forward and hold outer casing,
3. Clean the outer lens surface with non-staining glass cleaner,
4. Repeat for the other end of the lens

Cleaning the Prism Module

To clean the Frost blades, use the same technique as for the cross fade colours.
To clean the Prism, first manually move the Frost and Dim blades out of the optical path.
Then manually slide the prism into the centre of the module. This should now allow you access to clean both Prism surfaces as per the triplet lens.

Please take great care when cleaning any of the head modules. Mishandling or rough treatment will damage or misalign these delicate optical parts

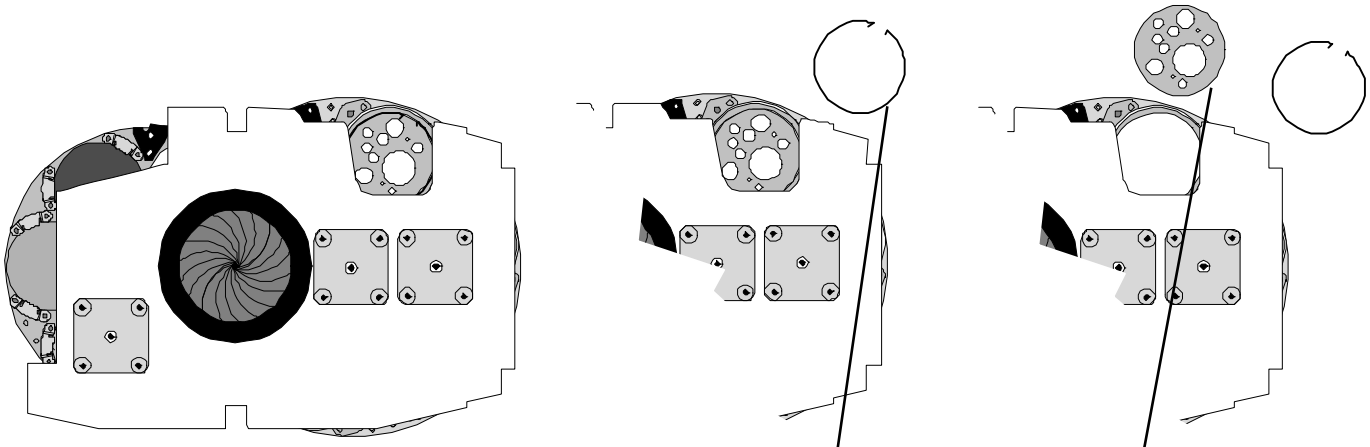
Important

When replacing any of the modules, please ensure the spring wires (at the top and bottom of each module) locate in the grooves cut into the two retaining bars. This ensures the optimum optical alignment of the different modules in the lamp.

Replacing Parts

Remove and Install Rotating gobos

The gobos can be easily changed by manually rotating the gobo holder to the cut-out in the gobo module plate. (The rear gobo plate has a hinged cover plate over the cut-out, which has to be opened prior to removing or replacing gobos). Then using a small pair of long nose pliers, remove the gobo retaining clip and gobo. Fit the new gobo and replace the retaining clip ensuring that the clip locates correctly into the groove cut into the gobo holder.



Rear view of Gobo module.
(shown outside fixture for clarity)

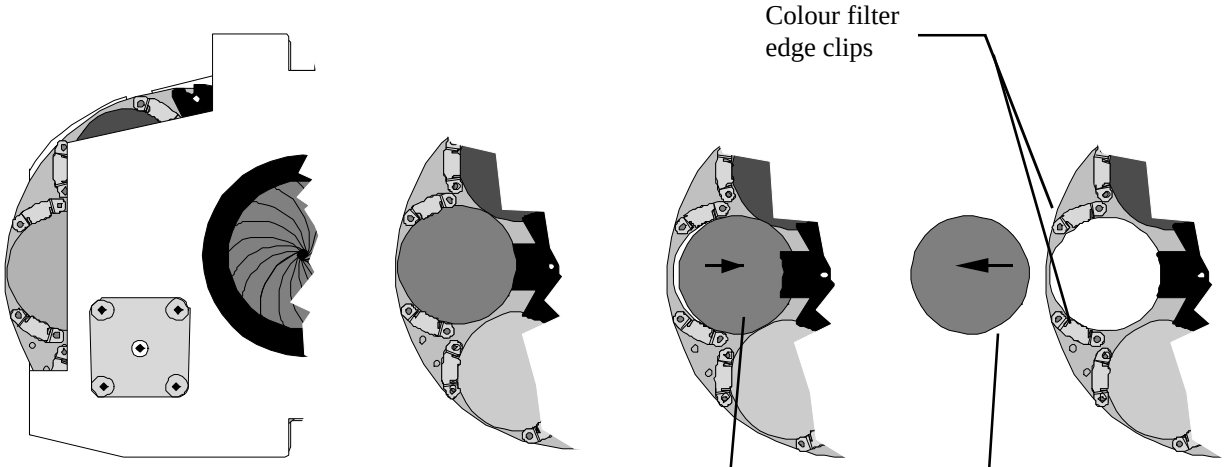
Remove Gobo retaining clip

Remove Gobo and replace

Remove and replace colour wheel Dichroic Filters

The colour filters can be removed by pushing the colour upwards, towards the middle of the wheel and under the centre retaining plate. Then **carefully** break the seal of the silicon rubber retainer with a small knife blade (avoiding touching the surface of the filter.) Once the filter has cleared the two edge retaining clips, tilt the filter away from the edge clips and slide out from under the centre retaining plate. **Warning:-The coating on the Dichroic Filters is very easily scratched!**

N.B. In current models, the filters are retained by 3 "beads" of silicon sealant making it easier to remove/replace them.



Colour filter edge clips

Rear of Colour/Gobo Module
(shown outside fixture for clarity)

Gently push the colour filter towards centre of the wheel

Once the colour filter is clear of the edge clips, tilt up and slide away from

Remove and install gobos in the optional Static Wheel.

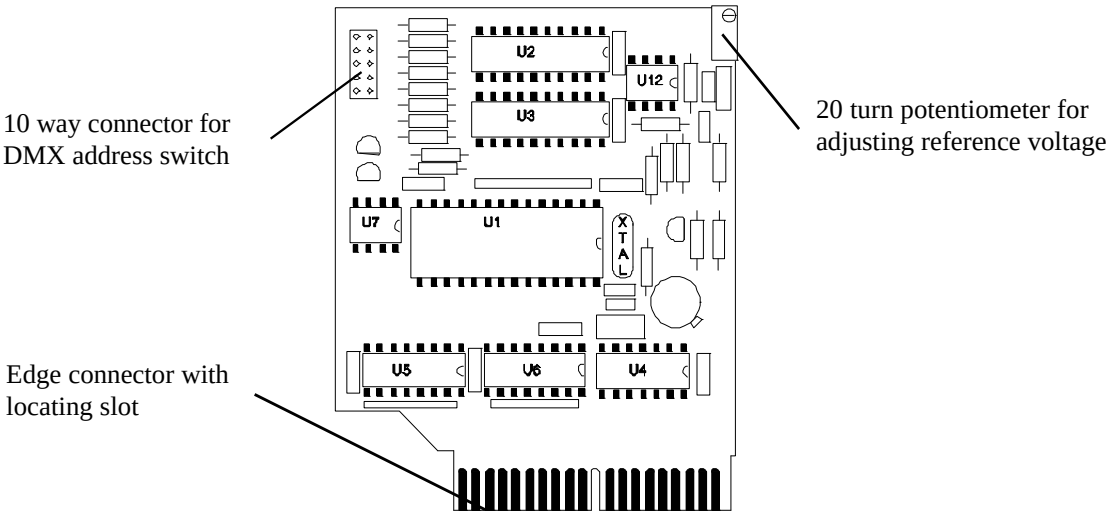
The gobos can be removed by pushing the gobo towards the middle of the wheel and under the centre retaining plate. Once the gobo has cleared the two edge retaining clips, tilt the gobo away from the edge clips and slide out from under the centre retaining plate.
Replace gobos by reversing the above procedure.

Starlite MK5 Adjustments

Adjusting the Decoder card reference voltage.

The 20 turn potentiometer located at the top of the decoder card in the first position of the head motherboard is used to set the reference voltage for the digital to analogue converters for pan and tilt positioning. If you replace the decoder card, you will need to re-set this pre-set for correct operation of the pan and tilt drives.

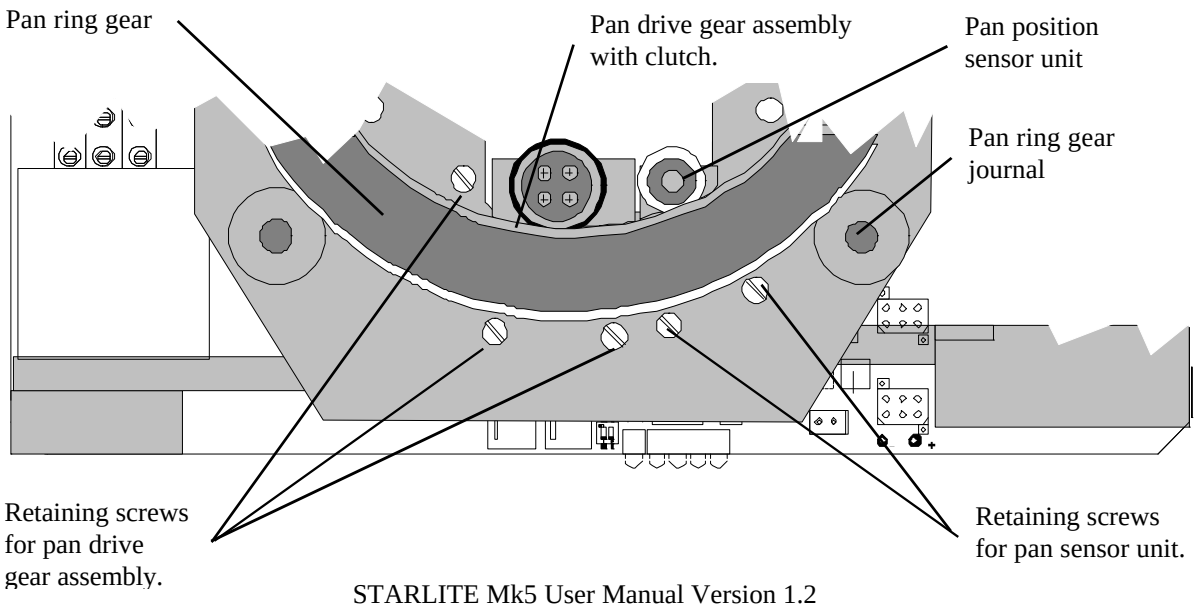
1) Remove the top head cover and secondary fan to gain access to the decoder card.
2) Power up the unit and connect a DMX signal.
3) Set the pan to zero and ensure that the pan moves to its zero end. Now set the pan to full and adjust the pre-set on the decoder card to set the full pan position.
4) Ensure that the pan does not drive into the end stops at either end as this will result in clutch slippage and wear.



STARLITE Mk5 DECODER CARD (Issue 3)

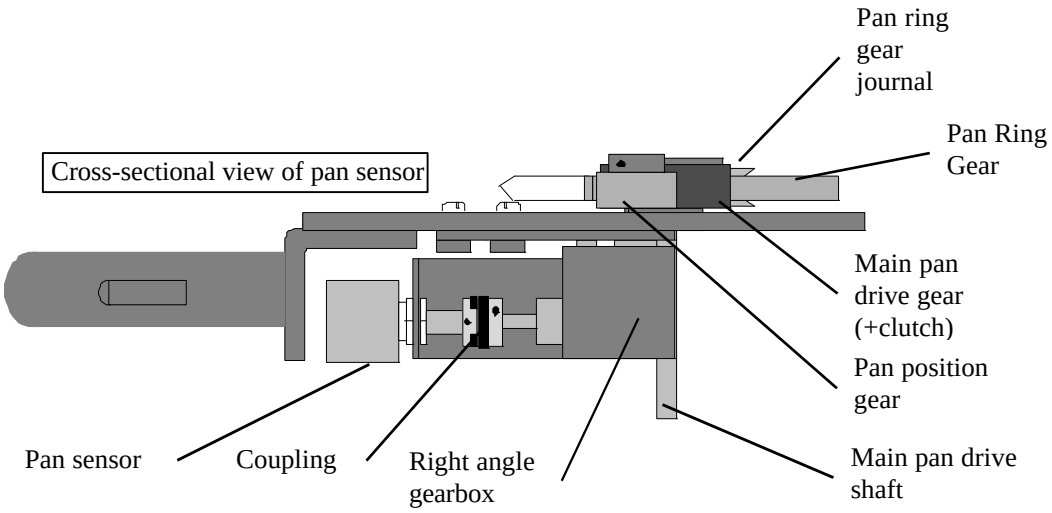
Adjusting the Pan position sensor(Earlier models)

This should not require adjustment during normal use. If adjustment is required, first unplug the unit and remove the cover over the main pan ring drive gear to expose the pan drive gear and position sensor.


Pan ring gear
Pan drive gear assembly with clutch.
Pan position sensor unit
Pan ring gear journal
Retaining screws for pan drive gear assembly.
Retaining screws for pan sensor unit.

To adjust Pan Sensor (cont.)

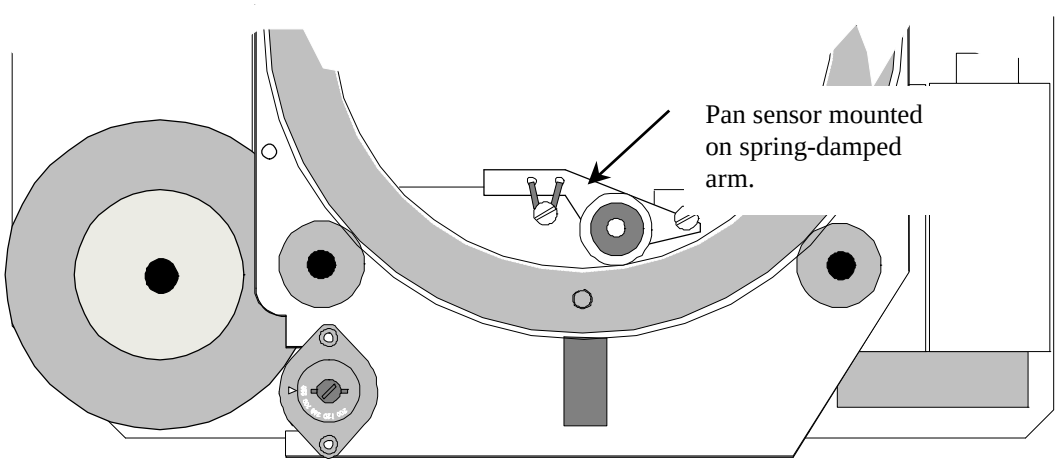
1. Loosen off the two retaining screws holding the Pan Sensor Unit. The unit should be loose enough to allow the sensor gear to become un-meshed from the ring gear.
2. Manually turn the sensor gear fully CCW till it reaches the end stop of the pot.
   (Do this with care, so that the pot is not damaged)
3. Manually turn the units head fully CCW until the end stop is engaged.
   (Ensure that the sensor unit out of the way and is not altered whilst doing this).
4. While holding the coupling on the sensor unit, to maintain the pot in it's fully CCW position, reposition the sensor unit, with the sensor gear correctly meshed into the ring gear.
5. Tighten up the two retaining screws ensuring that the sensor gear is only meshed with the main ring gear **and not** the ring gear and main drive gear. If the plate is moved to far over so that these gears mesh, the drive will be locked and damage may occur. The sensor gear should be meshed with a small amount of backlash to the main ring gear. This is to ensure that the minimum of side load is applied to the potentiometer assembly.



6. Power up the lamp and send the Pan to its full (CW) position, mid-position (50%) and check for position and full travel. Check that the motor does not drive against the clutch at either end of its travel. If this needs adjusting refer to the section on 'Adjusting the Decoder Card reference voltage'.

Adjusting the Pan position sensor(Current models)

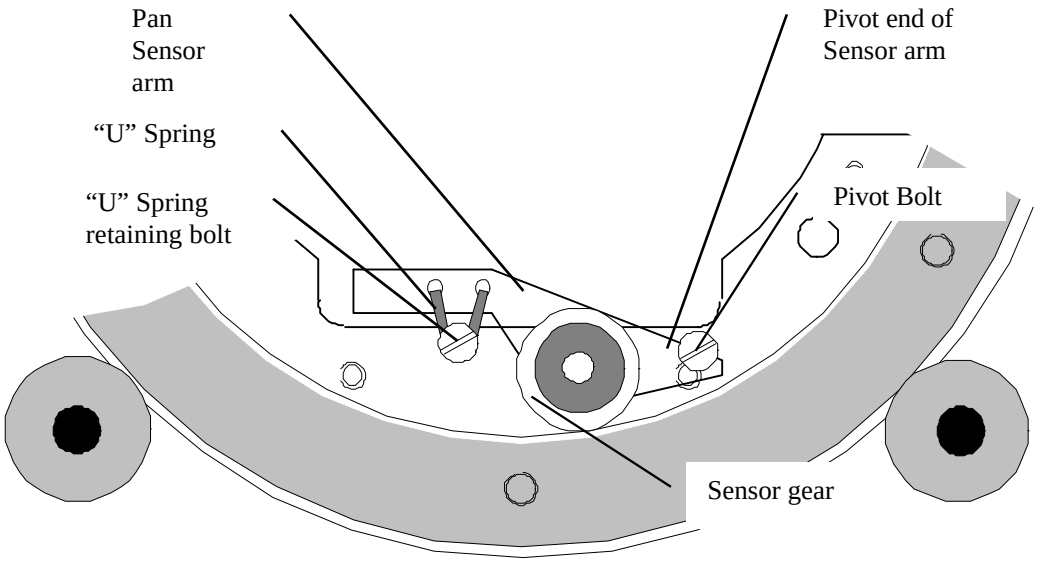
This should not require adjustment during normal use. If adjustment is required, first unplug the unit and remove the cover over the main pan ring drive gear to expose the pan drive gear and position sensor located on the "input connector" side of the base.



To adjust Pan Sensor (cont.)

1. Gently push the “U” spring over the head of the bolt to release the Pan Sensor arm from being meshed with the ring gear.
2. Manually turn the sensor gear fully CCW till it reaches the end stop of the pot. (Do this with care, so that the pot is not damaged).
3. Manually turn the units head fully CCW until the end stop is engaged.
4. Ensure that the sensor unit out of the way and is not altered whilst doing this.
5. Refit the sensor arm by first locating the pivot end, then with the sensor gear correctly meshed into the ring gear, replace the “U” spring over the head of the bolt.

The sensor gear should be meshed with a small amount of backlash to the main ring gear. This is to ensure that the minimum of side load is applied to the potentiometer assembly.

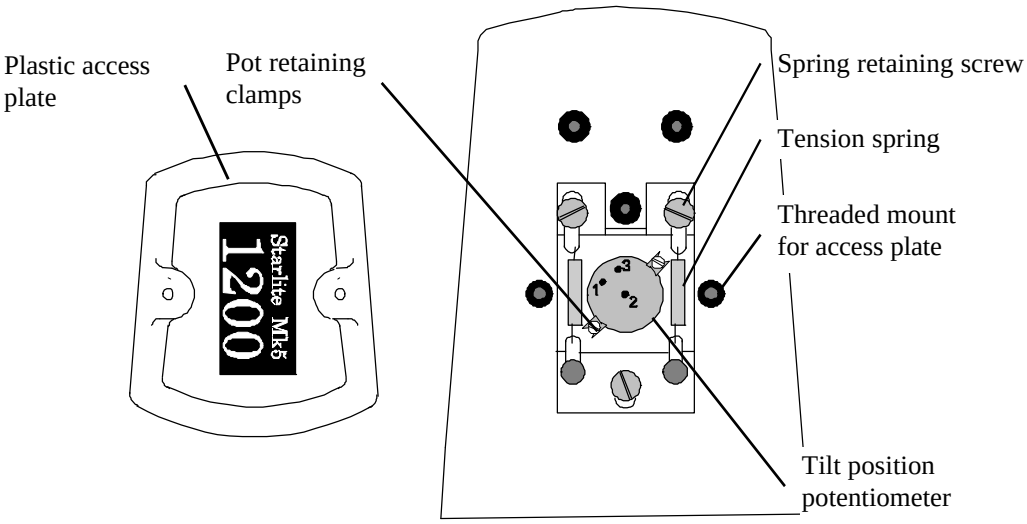


Adjusting the Pan Gearbox

The Pan gearbox and clutch assembly is factory set and therefore should not need any adjustment in normal use. If you suspect they need adjustment, please call for Technical Support or refer to a qualified engineer before attempting to make any alterations to the unit.

Adjusting the Tilt position sensor

1. Ensure that the pan drive is correctly set. Once this is set send the tilt to its mid position (50%) and then remove the plastic access plate on the side of the yoke to expose the tilt position potentiometer.

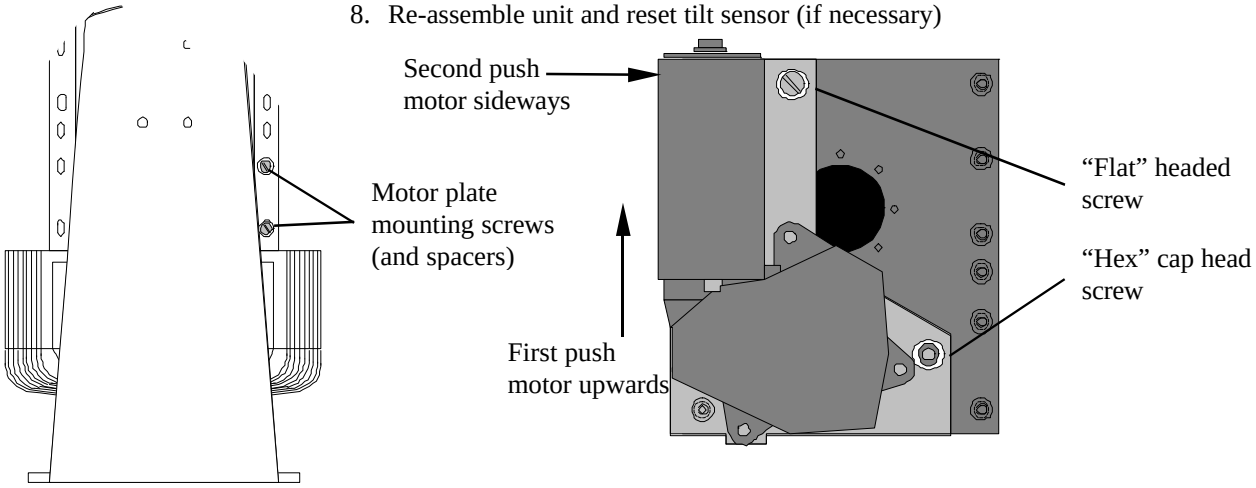


2. Slacken off the two pot retaining clamps and rotate the pot until the tilt is in the mid position. Re-tighten the clamps and replace the access cover.
3. The Tilt position mechanism is mounted on a spring loaded plate to ensure a constant mesh and side load. If this plate is removed, care should be taken as the plate is under tension. Slacken all 3 fixing screws and tilt the plate to remove tension before removing the top 2 screws and springs.

Adjusting the Tilt Gearbox

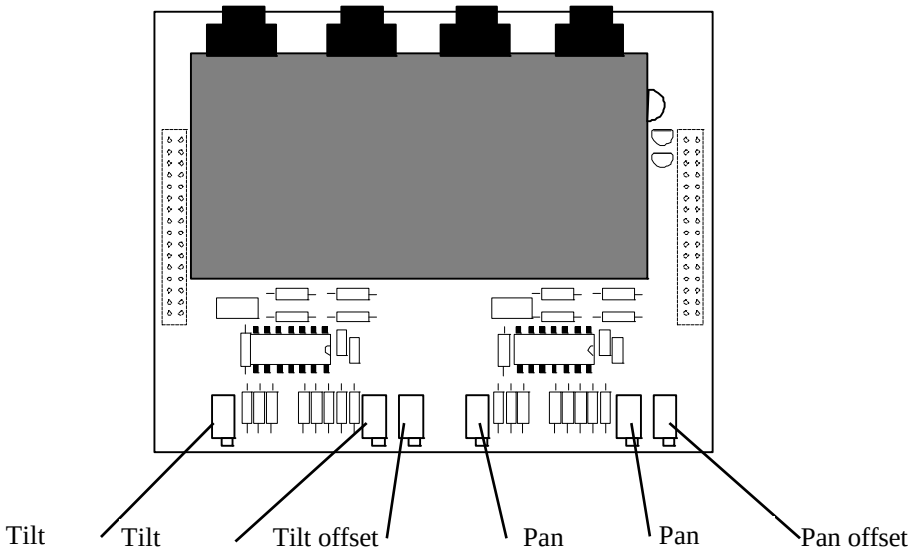
The tilt gearbox is factory set and should not need any adjustment. However, if the unit has been programmed in a situation with lots of fast, repetitive tilt moves, the tilt gearbox backlash may need to be adjusted to regain optimum performance.

1. Remove all the head modules.
2. Unplug and remove the head motherboard
3. Loosen the motor mounting plate screws from the outside of the unit.
4. From the inside of the unit, loosen off the two remaining screws holding the motor plate.
5. Push the motor plate upwards, towards the front of the head, and tighten up the hex cap head screw.
6. Then push the motor plate inwards, towards the hole in the tilt bearing and tighten up the flat headed screw.
7. Check and retighten both screws and then holding the yoke, check for play in the head movement.
8. Re-assemble unit and reset tilt sensor (if necessary)



Adjusting the Pan/Tilt Drive Card Settings

1. **If you have fitted a replacement drive card, ensure that the gain pots are turned fully anti-clockwise and the torque pots are turned fully clockwise prior to fitting. (These pre-set pots have approximately 23 turns.)**



2. Power the unit up and connect a test meter between the zero volt test point and the centre pin of the offset pot and adjust until a reading of zero volts DC is achieved. Repeat for both the pan and Tilt halves of the card.
3. Now adjust the gain pot a full 6 turns clockwise and repeat for both halves.
4. Adjust the torque pot anti-clockwise until the drive oscillates and an audible vibration is heard. Rotate clockwise until the drive becomes stable and then turn a further one and a half turns clockwise. Again repeat for both halves.
5. This is now a basic setting for stable drives.
6. You should now sequence the unit through a slow (30-second) movement of both pan and tilt drives and check for smooth movement. Adjust the gain pot to achieve the smoothest control whilst ensuring that the drives are stable.

Note:

If the drives become too unstable due to incorrect set-up, the fuses for the DC drive circuits will blow. In this event power down the unit and ensure that you complete step 1 above before replacing the fuses and re-powering the unit.

Fault-Finding and Repair

Introduction

Although the Starlite Mk 5 is designed for touring use and manufactured to the highest possible standards, screws will work loose and humans will forget to switch on switches or replace circuit boards, so this section of the manual is designed to help you quickly diagnose and solve many of the "little problems" associated with the use of "hi-tech" equipment in a relatively hostile environment. e.g. the entertainment industry

Many of the problems encountered are often of a simple nature and may be due to the persons unfamiliarity with the equipment or their belief that the manual is only required when a fault occurs or something does not work properly. In either case, please make sure they read and understand all of this manual before they go any further.

If the information in this section does not solve your problem and you need further assistance, please contact the technical support department (***See*** below) and provide the following information,

1. Your name and company
2. Your telephone and fax number(s) (1)
3. The unit serial number
4. A detailed description of the fault and any repair procedures you have tried. (2)

Note 1: It would be helpful if your telephone was close to the area in which you are repairing the unit.
Note 2: Often a faxed sketch diagram of the faulty part will help the Starlite engineer solve your problem faster. This is especially true when there is a conflict of languages or time-zones.

Technical Support

Please use one these contact methods if you require the assistance of the Starlite Technical Support Dept. or a qualified Starlite technician in your area.

- **Telephone: +44 (0) 1494 446000**
- **Fax: +44 (0) 1494 461024**
- **e-mail**
- **Web www.starlite.co.uk**

PROBLEM	POSSIBLE CAUSE(S)	REMEDY
Unit will not turn on	• no power • unit not switched on • faulty power connection • fuse failure	• connect unit to power source • switch unit on • check all power connections to unit • check fuses and replace
Unit resets but does not strike the lamp or respond to any control signal	• no DMX signal present at the unit	• connect DMX signal
Unit resets and strikes the lamp but does not respond to any control signal	• address switch set for self-test mode • wrong DMX address	• reset address switch to correct address
Unit functions but the lamp does not strike	• no lamp or bad lamp • bad/loose lamp connection • incorrect ballast tapping • safety interlock failure • unit is too hot • ballast/ignitor problem	• install/replace lamp • check all connections • adjust unit setting to match local electricity supply • check lamp housing door is properly closed • allow unit to cool • refer to qualified person

Fault-Finding (cont.)

PROBLEM	POSSIBLE CAUSE(S)	REMEDY
One unit is dimmer than others	• incorrect ballast tapping • bad lamp • lamp not correctly seated in lamp holder • dust and grease deposits	• adjust unit setting to match local electricity supply • replace lamp • re-seat lamp in holder after allowing to cool • clean unit
Unit is not responding to control desk	• wrong DMX address • bad data cable	• reset address switch to correct address • check connections and replace cables if necessary
Pan and/or Tilt driving to one end.	• decoder card unplugged/missing • Pan/Tilt card miss-plugged • Pan/Tilt DMX channels set at zero/full • Pan/Tilt card damaged	• re-plug/replace card • re-plug Pan/Tilt card • alter control settings • replace card
Pan and Tilt not driving at all.	• Pan/Tilt fuses blown • 5 Volt fuse blown • 12 Volt fuse blown • Pan/Tilt card loose/missing • Pan/Tilt card damaged	• Test/replace fuses (2.5 A) • Test/replace fuse (2 A) • Test/replace fuse (6.3 A) • re-plug/replace card • replace card
Head function(s) not working properly/at all.	• Drive card unplugged/missing • Drive card wrongly addressed • Module miss-plugged • Module damaged • Drive card “stalled” • Unit wrongly addressed	• re-plug/replace card • Re-address card • Re-plug module • Replace module • Power cycle unit (allow time for the bulb to cool) • Re-address unit
Gobo, colour wheel, iris not working properly/at all	• Drive card unplugged/missing • Drive card wrongly addressed • Module miss-plugged • Module damaged • Unit wrongly addressed	• re-plug/replace card • Re-address card • Check both ribbon cables connecting module to motherboard. • Replace module • Re-address unit
		•

Basic Tools and Test Equipment Required

The Starlite Mk 5 is designed to require the minimum of tools for general use and normal routine maintenance. Most of the tools listed below should be readily available in any technician's toolbox, but please note the following points;

- All fasteners used in the Starlite Mk 5 are of the standard **METRIC** type, apart from the exception of the lamp isolating posts which are UNC 8-32 x ¼".

- Some of the fasteners in the unit are tightened up to a specific tightness or "torque".
  The alteration of these fasteners is not recommended and therefore is not covered in this manual. Failure to observe this warning may lead to serious damage of the unit and a potential safety hazard and invalidate the warranty!

- Always use the correct size of screwdriver, socket or Hex driver for the fastener in question.
  DO NOT USE the closest "equivalent"!

- When necessary, always replace a fastener with the correct type.
  e.g. M3 x12 (i.e. thread diameter x thread length.)

Tools

Set of long reach hex keys or "Allen keys" (inc. 1.5mm AF to 6mm AF)

Set of flat bladed screwdrivers

Set of hex sockets (inc. 5mm, 5.5mm, 7mm, 8mm AF)

Pair of small "long-nosed" pliers

"Pre-set" trimming tool or small flat bladed screwdriver

Test Meter

Reasonably good quality multimeter (preferably digital) with Ohms, AC/DC Volts and continuity ranges.

Spares and Optional Extras

These are some of the more common spare parts and optional extras, which are available directly from Starlite or your distributor.

¼" turn "Camloc" base plate (complete)	Part No. 0340/C
Half coupler with "Camloc" fasteners(pair) (for base plate above)	Part No. 0339/0370/2
Half couplers and bolts for ordinary base plate	Part No. 0370/2
Spare ¼" turn fastener for covers/motherboard (with retainer)	Part No. 0296/0298
Position 1 colour filter for colour wheel (Blue 107)	Part No. 0349
Position 2 colour filter for colour wheel (Green 206)	Part No. 0352
Position 3 colour filter for colour wheel (Red 301)	Part No. 0353
Position 4 colour filter for colour wheel (CTC Orange)	Part No. 0350
Position 5 colour filter for colour wheel (CTC Blue)	Part No. 0351
Mk 5 Drive card	Part No. 0070/C
Mk 5 Decoder card	Part No. 0071/C
Mk 5 Pan/Tilt Drive card	Part No. 0074/C
Fuse insert for volt select switch	Part No. 0098/I
Secondary fan unit (complete, for earlier models) (Please state 575 or 1200W lamp model)	Part No. 0057/C
Gobo retaining clip	Part No. 0264
Gobo adapter ring (for 44mm gobos/glass gobos)	Part No. 0385
Fuses (pack of 10) 20mm, 2.5A (T) (for the fans, pan/tilt motors, 5 Volt DC)	Part No. 0450/10
Fuses (pack of 10) 20mm, 3.15A (T) (for the volt select switch)	Part No. 0452/10
Fuses (pack of 10) 20mm, 6.3A (T) (for the 24 volt stepper drive)	Part No. 0453/10
Fuses (pack of 10) 20mm, 10A (T) (for the 12 volt stepper drive)	Part No. 0454/10
Base cover screws and washers (set of 4)	Part No. 0207/4/C
PTFE lubricating oil (for rotating gobos)	Part No. 0455

Other colour filters, custom gobos and beam effects are available. Please enquire for details.

Sample DMX Addresses

The table below gives some sample DMX addresses (starting from channel 1) but the Starlite Mk5 can have **any** start address so long as there are 18 channels available after the start address.
(i.e. 19 channels total)

DMX Lamp No.	Position in Rig	Lamp Type	Channel No.	TO →	Channel No.	Start Address
1		Mk 5	1	→	19	1
2		Mk 5	20	→	38	20
3		Mk 5	39	→	57	39
4		Mk 5	58	→	76	58
5		Mk 5	77	→	95	77
6		Mk 5	96	→	114	96
7		Mk 5	115	→	133	115
8		Mk 5	134	→	152	134
9		Mk 5	153	→	171	153
10		Mk 5	172	→	190	172
11		Mk 5	191	→	209	191
12		Mk 5	210	→	228	210
13		Mk 5	229	→	247	229
14		Mk 5	248	→	266	248
15		Mk 5	267	→	285	267
16		Mk 5	286	→	304	286
17		Mk 5	305	→	323	305
18		Mk 5	324	→	342	324
19		Mk 5	343	→	361	343
20		Mk 5	362	→	380	362
21		Mk 5	381	→	399	381
22		Mk 5	400	→	418	400
23		Mk 5	419	→	437	419
24		Mk 5	438	→	456	438
25		Mk 5	457	→	475	457
26		Mk 5	476	→	494	476

Warranty Information

Warranty Information

Your Starlite MK5 fixture ('Unit') is covered by a 365-day parts and labour limited warranty against defects in material and workmanship from the date of purchase subject as follows:

1. It is the owners' responsibility to provide receipts or invoices for proof of purchase showing date, dealer or distributor. If purchase date cannot be provided, date of manufacture will be used to determine the period of warranty.
2. The unit must be returned to Starlite Systems Technology Limited and or its authorised distributors as soon as any defect is discovered. It is necessary to obtain a Return Authorisation Number from your dealer/point of purchase before any units are returned for repair. Any unit or parts of the unit must be packaged in a suitable manner to ensure protection of that unit or part. The package should be clearly marked that it contains a returned unit or part unit and include a written explanation of the alleged malfunction. Freight damage claims are invalid for units or parts shipped in non-factory boxes and packing materials.
3. All shipping costs to and from the distributor and or manufacturer must be paid for by the purchaser. Freight collect shipments will not be accepted.
4. Lamps are excluded from this warranty. Dichroic filters are not guaranteed against breakage or scratches to coatings.
5. Starlite Systems Technology Limited will make the final determination as to whether or not the unit or part is covered by warranty.
6. Starlite Systems Technology Limited will at their discretion repair or replace the unit or parts thereof in respect of which any defects arise from faulty materials or workmanship subject to the warranty conditions outlined herein.
7. Starlite Systems Technology Limited and its authorised distributors make no warranties, expressed or implied, with respect to any unit, and they specifically disclaim any warranty of merchantability or fitness for a particular purpose or as to conformity with any description or otherwise.
8. Warranty is void if the unit is misused, damaged, or modified in any way.
9. Except insofar as expressly forbidden by statute the undertakings contained in the preceding paragraphs of this clause are given in lieu of and to the exclusion of all conditions, warranties and representations whether express or implied by statute or otherwise as to the quality of the units or their fitness for any particular purpose or conformity with any description or otherwise.
10. Without prejudice to the foregoing Starlite Systems Technology Limited and its authorised distributors shall not be liable for any indirect, incidental, or consequential damage, including lost profits, sustained or incurred in connection with any unit or caused by unit defects or the partial or total failure of any unit regardless of the form of action, whether in contract, tort(including negligence), strict liability, or otherwise, and whether or not such damage was foreseen or unforeseen.
11. No authorised distributor has the power to vary the terms of this warranty.
12. This warranty will be interpreted according to English Law and the English courts shall have exclusive jurisdiction over any disputes.

Notes, Comments and Problems.

Please write down any notes, comments or problems you have using your Starlite Mk5 moving lights and send them to us. That way, we can do our best to improve the design and functionality of the unit.

Date	Unit Serial Number	Note, Comment or Problem	Action taken